The Competitiveness Initiative

of The University of Texas System

The University of Texas System

Nine Universities. Six Health Institutions. Unlimited Possibilities.

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A note on definitions of STEM(M) can be found at the end of this document.

For more information and detailed data please visit
www.utsystem.edu/competitive

The University of Texas System Competitiveness Initiative

Introduction

The University of Texas System Competitiveness Initiative is a $3 billion partnership with government, business, and donors to strengthen competitiveness at UT System institutions. This investment by the UT System Board of Regents set in motion a remarkable response to the Rising above the Gathering Storm *(RAGS) report written by the National Academies Committee on Science, Engineering, and Public Policy in 2006. The RAGS report noted that global competition for economic leadership is deeply rooted in science, technology, and health innovation. In order to maintain a U.S. competitive advantage and invigorate the U.S. economy, the RAGS report offered four critical elements that require strategic investments: education, research and technology development, competitive capacity, and incentives.*

The UT System Board of Regents demonstrated innovative vision and strong leadership in August 2006 by providing vital resources in each of these four areas. The result is an unprecedented transformation of UT System institutions that positions them to recruit the world's finest faculty to educate our children, and prepare them to be future scientists, engineers, mathematicians, and health care providers. These faculty will be housed in state-of-the-art facilities made possible through the Competitiveness Initiative, complete with laboratories and scientific equipment that facilitate unmatched discoveries and scientific advances. The benefits spread through the institution like tentacles, permeating growth in education, research, and competitive capacity.

By significantly enhancing the four critical elements from the RAGS report, the UT System is now poised to lead the world in improving the quality of life and saving lives. The timing of the investment ensures that UT System institutions maintain their competitive advantage despite the volatile global economic markets. The wisdom of the UT System Board of Regents has guaranteed that UT System institutions remain resilient, succeeding beyond anything we might have imagined and leaving a lasting legacy for generations to come.

The initial impact of these investments is described in this report and presented as summaries for each institution. The effect on education, research, faculty, and the public will be tracked for future reports each biennium.

UT System at a Glance

Education

Undergrad/post-bacc enrollment in STEMM, 2008	38,752
Graduate enrollment in STEMM, 2008	18,731

Research & Technology Development

Research expenditures, 2008	$2.2 billion
Federal research expenditures, 2008	$1.2 billion
Intellectual property revenues, 2005-2008	$139.3 million
New invention disclosures, 2005-2008	2,713
U.S. patents issued, 2005-2008	452
Licenses and options executed, 2005-2008	696
Start-up companies formed, 2005-2008	71

Incentives

Chancellor's Entrepreneurship & Innovation Awards	$25,000
Texas Ignition Fund	$1.6 million

Competitive Capacity

STARs faculty recruited	89
ETF research superiority award recipients	14
Physical Space (gross square footage)	
Teaching	5,914,000
Research	5,261,000
Clinical	616,000
Increase in total sq. ft. through initiative	25%
New STEMM-related endowments (2005-2008)	$291 million

Overview

Education

Education is a fundamental building block that ensures that the U.S. workforce is qualified to be a global leader in science, technology, and health and maintains the competitiveness of our national economic system. The authors of the RAGS report predict a shortage of adequately trained scientists, engineers, and clinicians for the types of jobs that will be available in the future. Thus, it is important that UT System institutions focus on increasing educational opportunities in science, technology, engineering, math, and medical/health (STEMM) fields.

The construction or renovations projects approved under the UT Competitiveness Initiative have increased academic physical space at the UT System by over 592,000 square feet. At the same time, UT System established almost 50 new degree programs in STEMM. These expanded opportunities for educational programs have been further strengthened by a variety of institutional initiatives that support student success in STEMM program areas.

The Competitiveness Initiative has been in place for two academic years and has shown a positive impact on student enrollment. Undergraduate and post-baccalaureate enrollment in STEMM majors has increased seven percent, with an increase of 2,400 students. Graduate enrollment has increased six percent, with an increase of more than 1,000 new students. These student enrollment growth trends may increase as new facilities are complete and new world-class faculty establish their research careers at UT System. In turn, we will likely observe an increase in STEMM degrees conferred, improved state and national rankings in areas related to education, and advances in other competitiveness indicators due to the increase in the pipeline of matriculated students.

Research & Technology Development

The UT Competitiveness Initiative made strategic investments in research and commercialization, primarily in competitive capacity and incentives (described in the sections that follow below). UT System institutions have maximized these investments by integrating external and institutional resources into the support provided by the UT System. For example, some institutions have significantly expanded their research and commercialization personnel while others have developed innovative programs to enhance faculty and student training, public-private partnerships, and the institution's economic impact on the region. Examples of these strategic directions are presented in each institutional summary.

One example of a system-wide investment to advance research and commercialization is based on a robust partnership between the UT System and Sandia National Laboratories. The UT System Board of Regents has collectively allocated $1.875 million from FY 2008-2010 for several major initiatives, listed below. Sandia National Laboratories has also allocated a one-to-one match to these investments.

UT System Partners with Sandia National Laboratories

Initiative	UT System Allocation
Joint Institute for Biosecurity Technology Acceleration and Commercialization	$625,000
Joint Institute for High Energy Density Science	$500,000
National Institute for Nano-Engineering	$300,000
National Initiative for Modeling and Simulation	$300,000
Healthcare Modeling	$100,000
Advanced Reconnaissance and Remote Sensing	$50,000
TOTAL	$1,875,000

The six initiatives listed above create a competitive advantage in solving "grand challenges" by building on complementary competencies of world-class researchers and resources. The finest researchers in the nation are working together on areas such as an aggregate model of health care delivery and health care financing, biodefense and emerging infectious disease, computational modeling of geosystems, computer-aided engineering for nanopatterning processes, laser science and technology, high energy physics, nano-enabled self-powering sensors,

nano-engineered chemical processing, and plasma science. The return on investment for the UT System Board of Regents is remarkable. For example, as of March 2009, the National Initiative for Modeling and Simulation had secured about $40 million in funding and had outstanding proposals for another $70 million. In addition to these monetary returns, the partnership is developing solutions to issues basic to the life of Americans, such as health, security, and energy.

A second example of a system-wide investment in research and commercialization is the Texas Advanced Computing Center (TACC) that received a $3 million investment from the UT System Board of Regents in 2006. The TACC provides researchers with the ability to increase the sophistication of research computations, answering societal problems such as predicting weather, modeling oil and water resources, and designing new drugs and treatments. The rise of computing in health-related research continues to grow rapidly in areas such as cancer treatment, epidemiology, bioinformatics, and system biology. TACC provides high-performance computing resources and support for researchers statewide by allocating computing time and/or data space via the TeraGrid (i.e., method of electronic connection). Through TACC, the largest computing system in the world for open science research, known as "Ranger," is available to researchers regardless of geographic location or departmental affiliation.

The synergy created by UT System investments in research and commercialization soon will be evident in research and commercialization productivity measures such as research expenditures, technology transfer activity (i.e., U.S. patents issued, licenses and options executed, start-up companies formed), and additional large-scale partnerships. Information about these measures is presented in the institutional summaries and, where possible, comparisons are made to national or peer trends (based on campus-specific lists of similar or aspirational institutions). Because of the lag time between proposal submission and actual expenditure of the grant award, the institutional summaries reflect more of a baseline comparison than the actual impact of investments from the UT System Competitiveness Initiative.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include:

- *Faculty recruitment,* or programs to bring world-class faculty to UT System institutions,
- *Infrastructure,* such as state-of-the-art buildings with advanced research laboratories and academic spaces,
- *Faculty awards,* or recognition programs to support faculty efforts, and
- *Philanthropy to support STEMM* initiatives, demonstrating interest from external donors.

These four areas of competitive capacity are inseparable; quality, cutting-edge research requires specially-designed laboratories outfitted with advanced equipment. These labs attract world-class researchers that translate the research findings to students, the public, and into inventions that affect everyday lives. The investments in competitive capacity as a result of the UT Competitiveness Initiative are outlined in each institutional summary.

Two significant tools that are used for faculty recruitment are the STARs (Science and Technology Acquisition and Recruitment) program and the Texas Emerging Technology Fund Research Superiority awards. The STARs program is funded by allocations of Permanent University Fund Bond Proceeds Reserves for Library, Equipment, Repair, and Rehabilitation (LERR) and amounts are designated by the UT System Board of Regents each fiscal year. To date, the UT System Board of Regents has allocated $124 million in STARs funds, with 71 percent allocated for use by academic institutions and 29 percent to health institutions. The STARs funds are administered by the Offices of Academic and Health Affairs and are often matched by institutional funds and private donations. Initially, competitive and non-competitive awards were granted by the Office of Academic Affairs, which has evolved into competitive awards only. The Office of Academic Affairs estimates that 50 faculty that received competitive STARs awards in FY 2005 and 2006 have brought over $198 million in research grants to UT System over the last three years, resulting in a $163 million total net return on the initial $35.3 million investment. Examples of additional benefits include patents issued, graduate students and post-doctoral fellows supported, and professional recognition gained for the institution.

The Texas Emerging Technology Fund Research Superiority Acquisition awards are administered by the Texas Governor's Office to bring the best and brightest researchers in the world to Texas. Priority is given to proposals that are interdisciplinary in scientific and technical fields that enhance the state's national and global economic

competitiveness, have secured matching funding, and are likely to lead to a medical or scientific breakthrough that can be commercialized in Texas. The UT System institutions have received Research Superiority Acquisition awards totaling $30.3 million from FY 2007 to June 2009. The UT System Board of Regents has invested $14 million to match funds received from the state.

Incentives

Various programs provide additional incentives to excel in science, technology, engineering, math and medical/health. Examples of these Systemwide or institutional programs are described in each institutional summary; the examples of institutional-specific incentive programs described in the institutional summaries are meant to be illustrative of incentives rather than comprehensive.

UT System Chancellor's Entrepreneurship and Innovation Awards that recognize inventors of a major scientific breakthrough that has broad-reaching societal impact. The Awards program was funded in 2006 and implemented as a result of the UT System Competitiveness Initiative. Institutions submitted nominees for two categories: research and innovation developed at a single institution, and research and innovation developed at multiple institutions. Award recipients received $10,000 and $15,000, respectively.

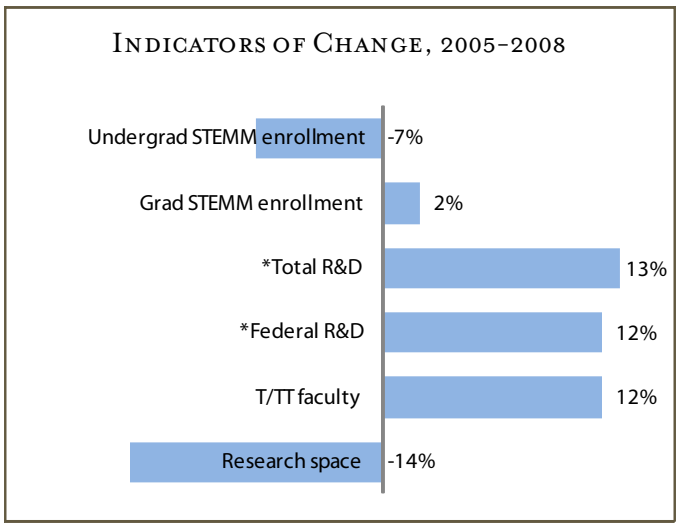
UT System Texas Ignition Fund (TIF), a seed-grant program to assist UT faculty in transforming discoveries into products that will attract angel or venture capital investors and advance the invention's path toward the marketplace. The Office of Research and Technology Transfer administers this $2 million grant program that was authorized by the Board of Regents in December 2007. The TIF has funded almost 37 projects thus far, distributing $1.6 million to 11 institutions. A fifth round of funding in fall 2009 is expected to deplete the remaining balance of the TIF funds. Current efforts are in place to seek external funding to replenish these funds.

Conclusion

The University of Texas System Board of Regents has made a significant contribution to meeting the goals set forth by the authors of the Rising above the Gathering Storm *report. The UT System Competitiveness Initiative has enhanced the competitive capacity of UT System institutions through direct financial investments in world-class faculty, physical infrastructure, and specific programs to bolster the mission of each university. These investments will continue to serve as a catalyst to educational and research outcomes. UT System institutions and the UT System will continue to track the progress of these substantial investments and their impact on a wide range of indicators for state and global competitiveness.*

The University of Texas at Arlington

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed $147 million to strengthen competitiveness at UT Arlington. Initial indicators of the impact of these investments are presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT Arlington at a Glance

Student enrollment in STEMM, 2008	
Undergraduate (STEMM % of total)	4,481 (24%)
Graduate (STEMM % of total)	1,967 (32%)
New faculty recruited (2005-2008)	
STARs faculty recruited	6
ETF research superiority award recipients	1
Physical space (square footage)	
Teaching	787,000
Research	204,000
Increase in total sq. ft. through initiative	14%
New STEMM-related endowments (2005-2008)	$2 million
Research expenditures, 2007	$33 million
Federal research expenditures, 2007	$20 million
Intellectual property revenue, 2005-2008	$1.7 million
U.S. patents issued, 2005-2008	15
Licenses/options executed, 2005-2008	21
Start-up companies, 2005-2008	9

Education

Under the UT System Competitiveness Initiative, UT Arlington increased its academic physical space by 82,000 square feet, or 8 percent. Increases in classroom space helped open the door to a new degree program in nursing. The Doctor of Nursing Practice is designed to train nurse practitioners within one of the 20 largest schools of nursing in the U.S. UTA has also provided tuition discounts for all STEMM Ph.D. students in order to be more competitive in attracting high-quality doctoral students and is planning to expand levels of financial support for these students.

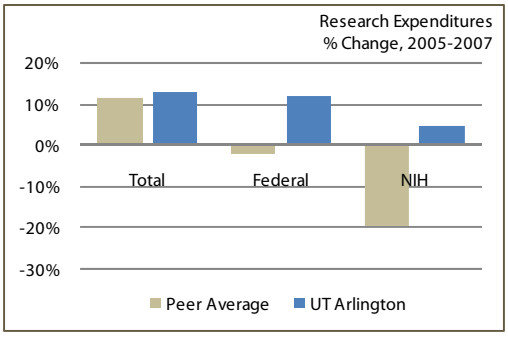
Approximately 1/4 of all undergraduate and 1/3 of all graduate students enrolled at UT Arlington major in science, technology, engineering, and math.

UT Arlington is focused on increasing educational opportunities in science, technology, engineering, math, and medical/health (STEMM) fields to overcome the workforce shortfall predicted in the RAGS report. Approximately one-quarter of all undergraduate and one-third of all graduate students enrolled at UTA major in STEMM fields. Undergraduate enrollment in STEMM has decreased by 7 percent at UT Arlington since 2005 while overall undergraduate enrollment has declined by 2 percent. This decline in STEMM enrollment is less than the 5 percent growth in undergraduate STEMM enrollment at all UT System academic institutions. An enrollment management plan is being implemented to significantly improve retention and graduation rates at the undergraduate level. Undergraduate student enrollment in nursing programs has remained relatively stable at near-capacity levels, declining by 1 percent. New online delivery models and additional funding will more than double the spaces available for new students in the next few years. Enrollment in health professions, however, increased 41 percent, adding an additional 29 undergraduate students. This trend is significantly higher than the 6 percent increase in undergraduate health professions enrollment at all UT System academic institutions.

Graduate enrollment in STEMM fields has increased 2 percent since 2005, adding an additional 43 students. This is less than the overall growth of 6 percent in graduate enrollment at UTA. The rate of increase at UTA is considerably less than the 9 percent increase of STEMM graduate students enrolled at all UT System academic institutions while graduate enrollment for all majors increased by 4 percent. UTA is identifying ways to improve this situation and is in the process of hiring a graduate retention and completion coordinator in the office of graduate studies to track and benchmark retention and graduation rates at the graduate level. Graduate student enrollment in nursing programs increased substantially, by 28 percent, compared to the 12 percent increase at all UT System academic institutions. Graduate enrollment in health professions has varied over the past four years, ranging from 135 to 162 students, with current enrollment approximately equal to 2005. In contrast, graduate health professions enrollment showed a steady increase of 12 percent at all UT System academic institutions.

Research & Technology Development

UT Arlington has shown a firm commitment to enhancing research activity and the reputation of the university. One way to increase research productivity and scholarship is to actively recruit experienced researchers to the institution. UTA has recently hired a substantial number of new faculty by creating new positions and replacing vacant ones, ultimately revitalizing the research enterprise. The institution also is ensuring that both new and existing faculty have the resources they need to produce outstanding results. The "excellence initiative" was established to identify resources that can provide incentives for new and existing faculty by raising funds for research support and salary enhancements for outstanding research faculty. These efforts will galvanize UT Arlington's goal of significant improvement in institutional rankings over the next decade.



Source: NSF, NIH.

With a focus towards economic development and by building strong partnerships (e.g., local chambers of commerce, business incubators, and industry), UT Arlington's research provides real life application to the technologies developed in its labs. Industry-financed research expenditures at UTA have increased 112 percent while peers have averaged a 6 percent decrease between 2005 and 2007.

UT Arlington is dedicated to forming strong partnerships with federal agencies and industrial representatives. One of the activities that UTA has undertaken to achieve this goal is an innovative electronic research search engine. Under the leadership of the Vice President for Research, the institution has developed a search engine for all research related resources at UTA, including faculty expertise, equipment, laboratories and research groups, research centers, research facilities, and technologies and patents. The intent of the electronic search engine is to facilitate research collaborations by allowing corporate representatives, faculty, and other interested parties to easily and effectively conduct direct searches for university resources. UT Arlington has invited other institutions to join this search engine concept, called the Collaborative Partnership, which allows inter-institutional searches of research resources. There are currently six academic institutions that have joined the partnership: UT Dallas, UT El Paso, UT Pan American, UT San Antonio, the University of North Texas Health Science Center, and the University of North Texas at Denton. Several members of the Texas Legislature and many state and federal agencies have shown strong interest in adopting the search engine for a variety of purposes.

To facilitate research collaborations, UT Arlington has developed an innovative search engine that allows corporate representatives, faculty, and others to search for research related resources such as faculty expertise, equipment, labs, facilities, technologies, and patents.

These investments in organizational excellence contribute to enhanced resources for faculty research projects, often tracked by the money spent to conduct the scientific investigations. Research expenditures at UTA have

increased 13 percent between 2005 and 2007, while peers averaged an 11 percent increase. Research expenditures from federal sources increased 12 percent during the same time period while peers averaged a 2 percent decrease. Research expenditures from grants awarded by the National Institutes of Health (NIH) were substantially different between UTA and its peers: UT Arlington increased by 5 percent and peers reported an almost 20 percent decrease. Over the next decade, total research expenditures are expected to increase substantially, or over 200 percent, to meet the $100 million goal outlined in the institution's strategic plan.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include: world-class faculty, innovative buildings with advanced research laboratories and academic spaces, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. UTA has increased the number of tenured/tenure track faculty by 12 percent, or 69 people, since 2005. Six faculty members were recruited through the UT System STARs (Science and Technology Acquisition and Recruitment) Program and eight faculty members were retained through the same program, with a total of $6.68 million in STARs funding.

STARs Faculty

Dr. Daniel Armstrong, Robert A. Welch Chair in Chemistry in the department of chemistry and biochemistry, was recruited from Iowa State University. Dr. Armstrong is one of the world's most highly cited scientists, with over 450 publications and 11 patents in analytical and biological chemistry. His research has led to a new class of ultra-high stability liquids that have a profound effect on many areas of science and technology.

Dr. Andrew Baum, Jenkins-Garrett Professor of Psychology and Director of the Biosciences and Bioengineering Center was recruited from the University of Pittsburgh. Dr. Baum is internationally renowned for his work on chronic stress and long-term consequences of traumatic or persistent stressors.

Dr. Paul Chippindale, professor of biology, was retained at UTA to further his work in the study of evolutionary relationships and biological diversity using DNA sequencing.

Dr. Purnendu Dasgupta, Jenkins Garrett Professor and chair of the department of chemistry and biochemistry, was recruited from Texas Tech University where he held the Paul Whitfield Horn Professor endowed chair. Dr. Dasgupta uses his expertise in analytical and environmental chemistry to study issues such as air pollution and automated sensors and devices.

Dr. Chris H. Q. Ding, professor of computer science and engineering, was recruited from Lawrence Berkeley National Laboratory. Dr. Ding has extensive expertise in bioinformatics, machine learning, and data mining. Many of Dr. Ding's professional papers are cited extensively, providing the foundation for research in analytic research.

Dr. Perry Fuchs, associate professor of psychology, remained at UTA to continue his work in behavioral neuroscience. Dr. Fuchs' research strives to understand the function of the nervous system, especially to explore the ways in which the brain processes pain responses.

Dr. Karen Johannesson, associate professor of geochemistry in the department of earth and environmental sciences remained at UTA to study groundwater flow systems and has since taken a position as associate professor of earth and environmental sciences at Tulane University.

Dr. Hanli Liu, professor of bioengineering and director of the Biomedical Optics Laboratory remained at UTA to study medical instrumentation and imaging using minimally invasive and non-invasive techniques. Dr. Liu is also an adjunct of the biomedical engineering program at UT Southwestern Medical Center and an affiliate of the Institute for Cancer Research at the UNT Health Science Center at Fort Worth.

STARs Faculty

Dr. J. Ping Liu, associate professor of physics, remained at UTA to continue his research in hard and soft magnetic nanoparticles and nanocomposite magnets. One area of Dr. Liu's research is to chemically synthesize various hard and soft magnetic nanoparticles and apply them in drug delivery.

Dr. Frederick MacDonnell, professor of inorganic and bioinorganic chemistry, remained at UTA to study chemical approaches to nanotechnology, including applications for solar hydrogen production and novel cancer chemotherapies. Dr. MacDonnell's work has led to two patents.

Dr. Robert Magnusson, Texas Instruments Distinguished University Chair in Nanoelectronics and professor of electrical engineering, was recruited from the University of Connecticut. The recruitment package also included support from the Texas Nanotechnology Research Superiority Initiative funded by the Texas Emerging Technology Fund. An experienced entrepreneur, Dr. Magnusson's work in nanostructured photonic devices has led to many patents and two spin-out companies, one of which (Resonant Sensors, Inc.) also has received funding from the TETF to expedite commercialization.

Dr. Fillia Makedon, Jenkins-Garrett Professor and chair of computer science and engineering was recruited from Dartmouth College. Dr. Makedon's computational and electronic systems expertise helps develop solutions for analyzing and detecting brain patterns in multiple sclerosis and a system for secure data sharing that could be used for numerous applications.

Dr. Efstathios Meletis, professor and chair of materials science and engineering, remained at UTA to continue his research in surface engineering, multifunctional thin films, and small-scale materials. He has invented novel plasma treatments for surface hardening, modification and producing functionally gradient surface layers.

Dr. Krishnan Rajeshwar, distinguished university professor and associate dean of the college of science, remained at UTA. Dr. Rajeshwar's research expertise includes areas such as solar hydrogen production and the chemistry/materials aspects of device applications including sensors, fuel cells, and capacitators.

Infrastructure

New construction and renovation of state-of-the-art buildings create educational and research possibilities that drive the competitiveness initiative. Funds from the Competitiveness Initiative have been used for a physics lab upgrade ($25,000), engineering instructional lab equipment ($500,000) and college of science instructional lab equipment ($500,000). UT Arlington's research space decreased 14% since 2005, losing almost 33,000 square feet. The Competitiveness Initiative will offset some of this loss by funding two new facilities that will add or renovate over 300,000 gross square feet of space: the Engineering Research Building and Engineering Laboratory Building.

Competitiveness Initiative Provides $139 million for Capital Projects at UT Arlington

The Engineering Research Building adds approximately 230,000 gross square feet of state-of-the-art multi-disciplinary teaching and research laboratories, laboratory support spaces, and underground utilities. The $116 million project is designed to achieve a LEED Silver Certification and benefit the computer science and engineering departments, the bioengineering department, and the science and engineering library. The project is expected to be completed in January 2011.

The Engineering Laboratory Building expansion consists of a new third-floor addition—approximately 27,000 gross square feet—and the renovation of two existing laboratory floors with 49,000 gsf to benefit the College of Engineering. The project will be completed in July 2009 at a cost of $23 million.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UTA raised $2.4 million in STEMM-specific endowments since FY 2005, including graduate fellowships, distinguished chairs to support faculty research, and student scholarships. Over $125,000 is distributed for STEMM research and scholarships on an annual basis from these new endowments. STEMM-related allocations equal 29 percent of the total philanthropic distribution per year.

Since 2005, UTA has raised $2.4 million in STEMM endowments that support graduate fellowships, faculty chairs, and scholarships.

Faculty Awards

The faculty at UTA are often recognized for their significant contributions to their areas of expertise and respective fields of study. For example, six faculty members received a National Science Foundation CAREER award, a prestigious grant in support of junior faculty who effectively integrate innovative education and research:

- Dr. Seong Jin Koh, assistant professor of material science and engineering;
- Dr. Yi-Jiun Su, assistant professor of physics, now at the Air Force Research Laboratory;
- Dr. Jean Gao, assistant professor of computer science and engineering;
- Dr. Bumsoo Han, assistant professor of mechanical and aerospace engineering;
- Dr. Alan Bowling, assistant professor of mechanical and aerospace engineering; and
- Dr. Samir Iqbal, assistant professor of electrical engineering.

Dr. Efstathia Yerende, assistant professor of curriculum and instruction, received a prestigious Fulbright Fellowship for further study and lectures on teacher education and language education at the University of Kankan in Guinea. Dr. Sedrick Ervin Huckaby, adjunct assistant professor of art, was awarded a Guggenheim Fellowship for stellar achievement that allowed him to share his talents in painting quilts and capturing important family histories. These awards are some examples of the national and international recognition received by faculty at UTA.

Incentives

Various Systemwide initiatives and institutional programs provide additional incentives to excel in science, technology, engineering, math, and medical/health.

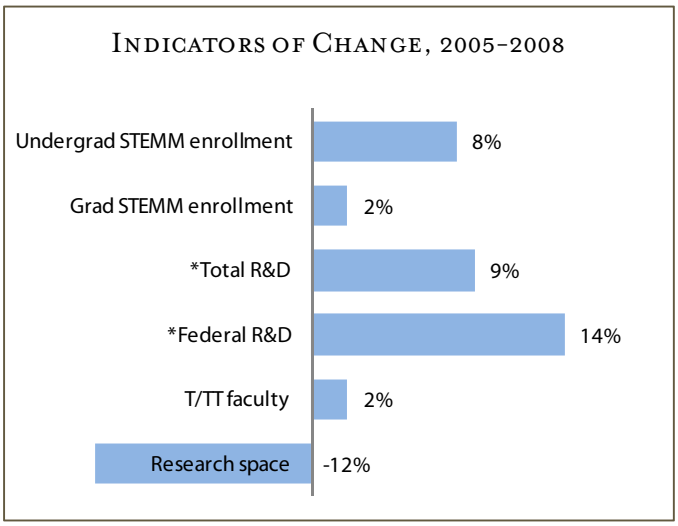
The UT System Texas Ignition Fund (TIF) has funded projects to commercialize nine inventions at UT Arlington:

- A wireless sensor to aid in the diagnosis of gastroesophageal reflux disease;
- A surface texture for solar cells that improves its energy efficiency and cost-effectiveness;
- A liquefaction process that converts lignite to heavy crude oil in less time and with less cost than previous methods;
- Prosthetic skin to improve the sense of touch in upper limb prosthetics;
- A wireless sensor system that is 5-10 times more energy efficient that existing ones;
- A respiratory support device that improves oxygen and carbon dioxide exchange in patients awaiting lung transplantation and those suffering from chronic obstructive pulmonary disease;
- A label-free detection instrument to screen and profile large and small biomolecules;
- A clean synthetic fuel process to convert North Texas Barnett Shale natural gas to synthetic transportation fuels such as gasoline, diesel and jet fuel; and
- An optically guided needle biopsy system for improved prostate cancer diagnosis.

UT System's Chancellor's Entrepreneurship and Innovation Awards recognized Dr. Khosrow Behbehani for the development of a device for the treatment of obstructive sleep apnea, called the automatic positive airway pressure device. Dr. Behbehani is professor and chair of bioengineering and is a Fellow of the American Institute of Medical and Biological Engineering.

The University of Texas at Austin

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $440 million to strengthen competitiveness at UT Austin. The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT Austin at a Glance

Student enrollment in STEMM, 2008	
Undergraduate (STEMM % of total)	13,961 (37%)
Graduate (STEMM % of total)	3,670 (34%)
New faculty recruited (2005-2008)	
STARs faculty recruited	49
ETF research superiority award recipients	7
Physical space (square footage)	
Teaching	1,992,000
Research	1,359,000
Increase in total sq. ft. through initiative	12%
New STEMM-related endowments (2005-2008)	$49 million
Research expenditures, 2008	$527 million
Federal research expenditures, 2008	$352 million
Intellectual property revenue, 2005-2008	$36 million
U.S. patents issued, 2005-2008	120
Licenses/options executed, 2005-2008	147
Start-up companies, 2005-2008	26

Education

UT Austin has used its resources in a wide variety of areas to meet the goals of the UT System Competitiveness Initiative. The institution has increased its academic physical space by 115,000 square feet, opening the door to changes in their educational curriculum. UT Austin established one new STEMM degree program—a Ph.D. in neuroscience—and is reforming their undergraduate curriculum across all colleges and schools at the university. A Center for Strategic Advising was established to assist students in developing purposeful educational strategies that will result in beneficial training and skills to best meet the students' life plans and goals.

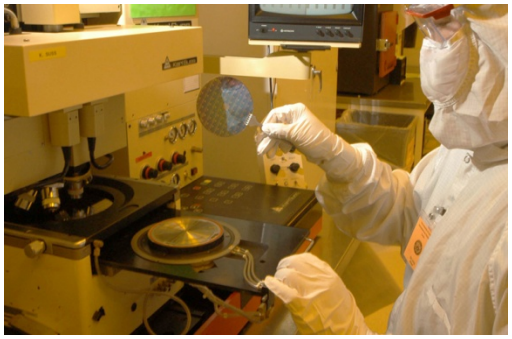
Approximately 1/3 of all undergraduate and graduate students enrolled at UT Austin major in science, technology, engineering, math, and medical/health fields.

UT Austin is focused on increasing educational opportunities in science, technology, engineering, math, and medical/health (STEMM) fields to overcome the workforce shortfall predicted in the RAGS report. Approximately one-third of all undergraduate and graduate students enrolled at UT Austin major in STEMM fields. Undergraduate enrollment in STEMM has increased by 8 percent at UT Austin since 2005, adding almost 1,000 new students, while overall undergraduate enrollment has increased by 3 percent. This growth trend in STEMM enrollment is greater than the 5 percent growth in undergraduate STEMM enrollment at all UT System academic institutions. Undergraduate student enrollment in nursing programs increased by 7 percent and enrollment in health professions increased 2 percent. These trends are less than the 9 percent nursing enrollment increase and the 6 percent increase in health professions enrollment at all UT System academic institutions.

Graduate enrollment in STEMM fields has increased 2 percent since 2005, adding an additional 73 students. This growth is larger than the overall graduate enrollment decline of 2 percent at UT Austin. The rate of increase at UT Austin is considerably less than the 9 percent increase of STEMM graduate students enrolled at all UT System academic institutions while graduate

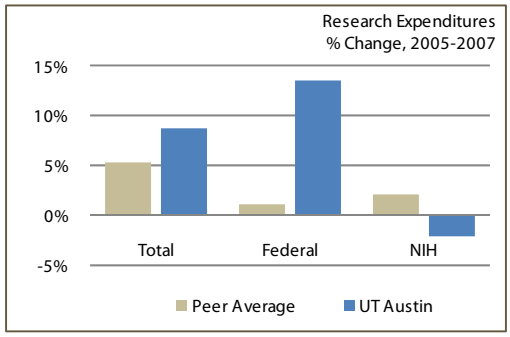
enrollment for all majors increased by 4 percent. Graduate student enrollment in nursing and health professions programs remained relatively stable, decreasing by six students (2%), and two students (3%), respectively. In contrast, enrollment increased at UT System academic institutions by 12 percent at both nursing and health professions programs.

Research & Technology Development



UT Austin is a state and national leader in solving problems through discovery and exploration and has the highest research activity of any academic university in the state of Texas. The university is consistently ranked in the top 25 public universities in the nation and is currently ranked 21st in research expenditures of all public institutions. UT Austin's research comprises 73 percent of the total research expenditures of all UT System academic institutions.

UT Austin has an impressive array of organizational divisions to generate quality research. More than 100 research units, with many centered at the intersection of traditional areas of science, enable UT Austin to lead discovery in emerging areas. Under the Competitiveness Initiative, UT Austin has made significant discoveries in biofuels, astronomy, nanotechnology, atomic physics, genetics, and social science.



Source: NSF, NIH.

Expertise in these leading areas of research is often benchmarked by the money spent to conduct the scientific investigations. Research expenditures at UT Austin exceeded one-half billion dollars in 2008, increasing 9 percent between 2005 and 2007, while national peers averaged a 5 percent increase. Research expenditures from federal sources increased 14 percent during the same time period while peers averaged a 1 percent increase. However, research expenditures from grants awarded by the National Institutes of Health (NIH) increased less than its peers: UT Austin decreased by 2 percent and peers reported a 2 percent increase. NIH funding has substantially increased at UT Austin more recently, which is expected to reverse the declines shown here for the near future.

The research projects related to the impressive climb in research expenditures often lead to breakthrough discoveries. One example is the use of algae as a cost-effective renewable fuel source. Organic Fuels Algae Technologies was formed to commercialize the oil production system developed at UT Austin's Center for Electromechanics. At the core of these technologies is a unique proprietary oil extraction technology that removes the oil from the algae by destroying the cell wall electromechanically. With an extraction unit targeted for completion by the end of 2009, commercial deployment is expected to be achieved within two to three years.

Another example is work produced by the Gulf Coast Carbon Center, the leading academic research group in the country testing carbon sequestration, the geological storage of carbon dioxide and possibly one of the best solutions to the problem of power plant emissions of carbon dioxide. Receiving more than $53 million in funding since 2007, the center conducted the country's first pilot test and now its largest overall test of carbon storage underground, in efforts being closely observed by Secretary of Energy Stephen Chu and others calling for expanded carbon sequestration research. Because the geology of Texas is outstanding for carbon sequestration, research from the center could help create a dynamic new industry in Texas for carbon storage in addition to having global impact.

U.S. Department of Energy named UT Austin as the location for two new Energy Frontier Research Centers with $30.5 million in total funding over five years. Both centers will collaborate with Sandia National Laboratories.

These two examples of potentially marketable products developed by UT Austin faculty demonstrate the institution's leadership role in energy research and development. The U.S. Department of Energy Office of Science recently

named UT Austin as the location for two new Energy Frontier Research Centers "to accelerate the scientific breakthroughs needed to build a new 21st-century energy economy." The centers are 2 of 46 centers named in 2009 and UT Austin is one of three universities to receive two centers (the others were MIT and Northwestern University). The first center, Understanding Charge Separation and Transfer at Interfaces in Energy Materials and Devices, will receive $15 million over five years allocated from the 2009 American Recovery and Reinvestment Act. The research will focus on nanostructured molecular materials for electrical energy storage and organic photovoltaic applications. The second center, Frontiers of Subsurface Energy Security, will receive $15.5 million over five years to study the movement or transport of carbon dioxide and other greenhouse gases in geological systems. Both centers will collaborate with Sandia National Laboratories.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include: world-class faculty, innovative buildings with advanced research laboratories and academic spaces, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their fields leads to major innovations in discovery, development, and application of research. UT Austin has increased the number of tenured/tenure track faculty by 2 percent, or 29 people, since 2005.

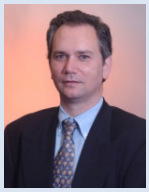
Thirty-five faculty members were recruited and seven were retained through the UT System STARs (Science and Technology Acquisition and Recruitment) Program in the departments of chemistry and biochemistry, chemical engineering, civil engineering, computer sciences, electrical and computer engineering, geological sciences, human ecology, linguistics, materials science and engineering, mechanical engineering, molecular cell and developmental biology, molecular genetics and microbiology, neurobiology, petroleum and geosystems engineering, pharmacy, physics, psychology, and sociology. STARs awards totaled $19.8 million to support these 42 faculty members.

In addition to the STARs Program, the Texas Emerging Technology Fund (TETF) supported two separate initiatives to attract world-class researchers to UT Austin. The first award for the Texas Nanoelectronics Research Superiority Initiative funded seven researchers at UT Austin, UT Arlington, and UT Dallas with a public-private partnership of $10 million from the TETF, $10 million from UT System, and $10 million from industry partners. Four researchers have been approved by the advisory board to join the faculty at UT Austin: Dr. Julian Cheng, Dr. Rodney Ruoff, Dr. Edward Yu, and Dr. Xiaoyang Zhu.

STARs Faculty Members of the National Academies

Dr. Richard Aldrich is Karl Folkers Chair in Interdisciplinary Biomedical Research II and professor of neurobiology. The $500,000 STARs award helped recruit Dr. Aldrich to UT Austin from Stanford University to continue his work in understanding electrical signaling in cells. Dr. Aldrich is a member of the National Academy of Sciences.

Dr. Robert Dickinson is professor of geological sciences and a member of the National Academy of Sciences, National Academy of Engineering, and a foreign member of the Chinese Academy of Sciences. Dr. Dickinson's was recruited from Georgia Tech to continue his research in climate modeling and change.



Dr. George Georgiou is Cockrell Family Regents Chair in Engineering No. 9 and professor of chemical and biomedical engineering. He is a member of the National Academy of Engineering and co-developed the leading protein therapeutic for treating inhaled anthrax. The $500,000 STARs award enabled Dr. Georgiou to continue his internationally recognized scholarship at UT Austin.

Dr. Jonathan Sessler is Rowland Pettit Centennial Professor in Chemistry. He is a member of the National Academy of Sciences and is a world renowned "molecular engineer," developing compounds for novel therapeutic or diagnostic agents. The $500,000 STARs award enabled Dr. Sessler to continue his internationally recognized scholarship at UT Austin.

Dr. William Press is the Warren J. and Viola M. Raymer Chair in Computer Sciences and Integrative Biology and a member of the National Academy of Sciences. The $1 million STARs award helped bring Dr. Press to UT Austin following his service as Deputy Laboratory Director at Los Alamos National Laboratory. Dr. Press was recently named to serve on the President's Council of Advisors on Science and Technology (PCAST).

The second TETF award funded the recruitment of three researchers to UT Austin for the Neuroscience Imaging Center. The center provides three different scientific approaches to visualizing the nervous system and nerve cell

function. Two faculty members—Dr. Kristen Harris and Dr. Max Snodderly—have joined UT Austin, and one more is currently being evaluated by TETF for approval.

Infrastructure

New construction and renovation of existing facilities to create state-of-the-art buildings provide educational and research possibilities that drive the competitiveness initiative. UT Austin faces challenges associated with its research facilities due to aging facilities and changing teaching and research requirements. To address this issue, UT Austin is currently developing a systematic plan for facilities enhancement and preservation and has made significant progress in space management capability. Physical research space has declined by 12 percent since 2005, losing 177,000 square feet even though the UT System Competitiveness Initiative has added or renovated more than 452,000 square feet of research space. Another 650,000 square feet will be added under the Competitiveness Initiative as current construction and renovation projects are completed. Specifically, the Competitiveness Initiative funded seven new and/or renovated facilities: expansion of the Applied Research Laboratory, the Biomedical Engineering Building, Dell Computer Science Hall, Dell Pediatric Research Institute, the Norman Hackerman Building, a vivarium, and renovations to the Robert A. Welch Hall.

Competitiveness Initiative Provides $420 million for Capital Projects at UT Austin

The Applied Research Laboratory (ARL) Expansion, named the McKinney Wing, Phase II, was necessary to maintain competitiveness for external research funding and qualified staff necessary to meet the lab's goals. The $3.5 million construction project is complete and was fully funded by research grants. ARL was established at UT Austin in 1946 as an organized research unit dedicated to improving the U.S. military's capability in applications such as acoustics, electromagnetic, and information technology. ARL's operating budget was $68 million in FY 2008.

The Biomedical Engineering Building provides six floors of space to consolidate the department of biomedical engineering previously housed in three separate facilities. Laboratory space will be provided for the department of medicinal chemistry and teaching laboratory space will be available for the department of biology. The first two stages of this $77 million project were completed and occupied in August, 2008. At the request of UT Austin, a third stage consisting of an additional 39,000 GSF of research and teaching lab space was added to the project in February, 2008, and will be completed in December 2010.

The Dell Computer Science Hall will add 132,000 total square feet of space in five floors plus a basement. The construction will include demolition of an outdated chilling station, which has been replaced by UT Austin as part of a separate project. The new $67 million project includes demolition of Taylor Hall and connecting the new building to the Applied Computational Engineering and Sciences Building.

The Dell Pediatric Research Institute will establish a pediatric health research institute in Austin. Combining UT Austin's core expertise in life sciences with the new Dell Children's Medical Center will establish Austin as a center of excellence for children's health and biomedical research. The $97 million project is complete, adding 150,000 gross square feet to the campus inventory, of which almost 100,000 will be designated for research purposes. The Dell Pediatric Research Institute is the first phase of development at The University of Texas Health Research Campus, a 15-acre property leased from the City of Austin within the 711-acre Robert Mueller Municipal Airport Reuse and Redevelopment Plan in East Austin.

The Norman Hackerman Building/ Vivarium/ Robert A. Welch Hall project will add approximately 287,000 gross square feet with modern, technology-enabled classrooms and undergraduate teaching laboratories critical to UT Austin's ability to continue to provide excellence in science education. The building will provide office and laboratory research space to recruit and retain faculty in critical academic initiative areas such as chemistry, neuroscience, computational biology, environmental sciences, pharmacy, and molecular and cellular biology. Included in the $175 million project is a vivarium of approximately 20,000 gross square feet that will be used to support research conducted in the Norman Hackerman Building. The project also includes Phase I renovations to approximately 50,000 gross square feet of Welch Hall for use as a modern chemistry teaching and research laboratory building.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join its commitment to excellence. UT Austin raised $48.5 million in STEMM-specific endowments since FY 2005, including graduate fellowships, distinguished chairs to support faculty research, and student scholarships. More than $4.8 million is distributed for STEMM research and scholarships on an annual basis from these new endowments. STEMM-related allocations equal almost 60 percent of the total philanthropic distribution per year.

Charitable contributions will also support infrastructure related to the UT System Competitiveness Initiative. A total of $63 million in donations was raised to enhance physical research and teaching space, including $47 million for the Dell Computer Science Hall and $8 million each for the Dell Pediatric Research Institute and the Biomedical Engineering Building. These gifts match substantial investments allocated by the UT System Board of Regents, the State of Texas, external granting agencies, and UT Austin.

Since 2005, UT Austin has raised $48.5 million for endowments supporting science, technology, engineering, math, and medical/health fields. From these new endowments, almost $5 million is distributed annually for STEMM-related research and scholarships.

Faculty Awards

The faculty at UT Austin are often recognized for their exceptional leadership and significant contributions to their respective fields of study. The institution's competitive stature is enhanced by the recognition that these awards bring and the experiences that are then shared with students, colleagues, and the community. For example, five UT Austin faculty members have received MERIT (Method to Extend Research in Time) Awards from the National Institutes of Health, a true symbol of scientific achievement in the research community. MERIT awards are rare, offered to less than 5 percent of NIH-funded investigators, limited to those who have demonstrated superior competence and outstanding productivity in previous research efforts. MERIT awards provide investigators with long-term, stable research funding to foster their continued creativity without the burden of preparing frequent research grant proposals.

NIH MERIT Award Recipients

Dr. Kristen Harris, Professor of Neurobiology and expert in neuroscience imaging to understand the structural components involved in learning and memory.

Dr. Daniel Johnston, Director of the Center for Learning and Memory, Institute for Neuroscience, and Karl Folkers Chair in Interdisciplinary Biomedical Research. Dr. Johnston's expertise is in the use of imaging to understand brain function associated with memory.

Dr. Hung-Wen (Ben) Liu, Professor of Chemistry and Biochemistry, Professor of Pharmacy, and George H. Hitchings Regents Chair in Drug Design. Dr. Liu's research team studies the mechanisms of enzymes involved in biological processes and the engineering of biological pathways important to drug development.

Dr. Shelley Payne, Professor of Molecular Genetics and Microbiology and University Distinguished Teaching Professor. Dr. Payne is an expert in genetics and regulation of disease causing pathogens.

Dr. Wesley Thompson, Professor of Neurobiology and member of the Institute for Neuroscience and the Institute for Cell and Molecular Biology, is internationally recognized for his use of imaging to study the regeneration of nervous system connections, especially in the brain, following nerve injury.

Faculty at UT Austin are recognized by other prominent agencies for their outstanding research. Since 2005, the National Science Foundation has also awarded more than 50 junior faculty at UT Austin with a prestigious CAREER award, providing grant funding to those who effectively integrate innovative education and research. Five faculty have been invited into the National Academy of Sciences, eight into the National Academy of Engineering, seven into the American Academy of Arts and Sciences, and three into the American Academy of Nursing. The American Association for the Advancement of Science has named nine Fellows from UT Austin during this time, deeming their work toward the advancement of science or its applications as "scientifically or socially distinguished." These are just a few examples of the awards bestowed upon UT Austin faculty; many more examples of exceptional work can be found in institutional reports.

U.S. President George W. Bush presents C. Grant Willson with a National Medal of Technology and Innovation during an East Room ceremony at the White House on September 29, 2008, in Washington, D.C. (Photo by Alex Wong/Getty Images North America)

The National Medal of Technology and Innovation, the highest U.S. honor for science and technology, was awarded to Dr. C. Grant Willson, Rashid Engineering Regents Chair of Chemical Engineering, by President George W. Bush in 2008. Dr. Willson's work has transformed the competitiveness of the microelectronics industry by inventing materials and techniques to efficiently manufacture smaller microelectronic components.

Incentives

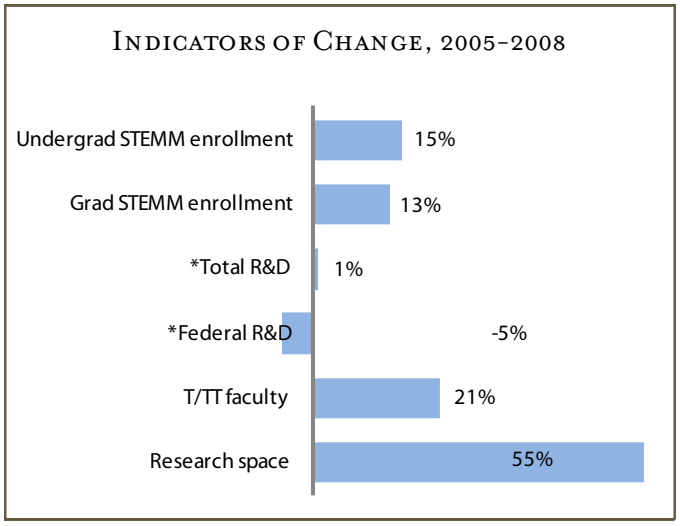
Various Systemwide initiatives and institutional programs provide additional incentives to excel in science, technology, engineering, math, and medical/health. The UT System's Chancellor's Entrepreneurship and Innovation Awards recognized Drs. C. Grant Willson and S. V. Sreenivason for their work in nanomanufacturing and step and flash lithography. Dr. Willson joined UT Austin in 1993 and is the co-author of more than 300 journal publications, several books, and is co-inventor on more than 25 issued patents.

The UT System Texas Ignition Fund has funded projects to commercialize five inventions at UT Austin:

- An algae biofuel extraction process
- Engineered skin substitutes that could be used in the treatment of diabetic foot ulcers, chronic leg ulcers, and burns
- Next-generation solar cells through a novel method for seeding the growth of semiconductor nanoparticles into a conducting polymer matrix
- Power systems for medical devices (collaboration between UT Austin, UT Health Science Center-San Antonio, and UT San Antonio)
- Ultrafast laser scalpel with imaging that could allow diagnosis and removal of small skin cancer lesions during a single outpatient procedure

The University of Texas at Brownsville

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $34 million to strengthen competitiveness at UT Brownsville. The initial impact of these investments is presented here, organized according to the critical elements described by RAGS: education, research and technology development, and competitive capacity.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT Brownsville at a Glance

Student enrollment in STEMM, 2008	
Undergraduate (STEMM % of total)	952 (6%)
Graduate (STEMM % of total)	36 (4%)
New faculty recruited (2005-2008)	56
Physical space (square footage)	
Teaching	130,000
Research	7,600
Increase in total sq. ft. through initiative	10%
New STEMM-related endowments (2005-2008)	$112,000
Research expenditures, 2008	$6 million
Federal research expenditures, 2008	$4 million
New invention disclosures, 2005-2008	1

Education

Under the UT System Competitiveness Initiative, UT Brownsville increased its academic physical space by more than 18,000 square feet, or 14 percent. This expansion has led to institutional priorities in education, particularly focused on enhancing student success, improving accessibility, expanding services, and promoting teaching and learning excellence. A major initiative that has emerged is the Math and Science Academy that allows high school students to complete two years of college concurrently with high school. The Academy fills a need to train more mathematicians, engineers, and scientists while giving high school students the opportunity to leave the program with up to 68 hours of college credit.

UT Brownsville also is committed to strengthening and developing quality programs that attract top students and faculty. These educational opportunities are those identified as having high economic demand: biology, environmental sciences, bilingual education, business administration (i.e., entrepreneurship, international business, and marketing) and health care professions.

New and enhanced undergraduate programs have led to a 15 percent increase in enrollment in STEMM majors at UT Brownsville. This growth trend is significantly higher than the 5 percent growth in undergraduate STEMM enrollment at all UT System academic institutions. In fall 2008, approximately 6 percent of all undergraduate students enrolled at UT Brownsville have chosen to major in a STEMM field. Undergraduate student enrollment in nursing programs increased 41 percent (226 students), which is significantly higher than the 9 percent growth trend at all UT System academic institutions. In contrast, undergraduate enrollment in health professions decreased 6 percent (19 students). This growth trend is less than the 6 percent increase in health professions enrollment at all UT System academic institutions.

Undergraduate enrollment in STEMM has increased 15% since 2005 because of new and enhanced undergraduate programs.

Graduate enrollment in STEMM has remained steady during the last four years averaging 36 students per year. STEMM graduate students comprise 4 percent of all graduate students at UT Brownsville. Graduate student enrollment in nursing remained relatively stable, while enrollment increased 12 percent at all UT System academic institutions. The new health professions graduate program enrolled its first students and is expected to grow to fill the needs of the region.

Research & Technology Development

UT Brownsville has shown a firm commitment to enhancing research activity and has created a new Office of Research. Dr. Luis Colom, professor of neurosciences and director of the Center for Biomedical Studies, serves as the inaugural Interim Vice President for Research. The new office is charged with supporting the success of research centers and implementing policies and procedures for technology transfer activities.

Research activities have expanded to include, astrophysics, biomedicine, environmental sciences, mathematics, computer sciences, nanotechnology and bilingual education among others. The university has actively participated in environmental projects including the largest wetland restoration project in the U.S. at the Bahia Grande. The university has also established partnerships with biotechnology companies to start projects in renewable energy and is actively supported by the South Texas Technology Management (STTM) for technology transfer activities. Faculty incentives for research, supported through the new Office of Research, are currently in the planning phase with the University Research Council and will be implemented in 2009.

The community has invested approximately $30 million through local Texas Southmost College bond projects in the International Technology Education and Commerce Center (ITECC) since 2002, including a recently completed $17 million facility improvement. A new division of Economic Development and Community Services was created at UT Brownsville in May 2009 to intensify university efforts in regional economic development. The new Vice President, Irv Downing, is responsible for ITECC's existing workforce development, business incubation and international trade assistance programs, as well as a new initiative that will focus on university research and commercialization collaboration with technology based companies.

The International Innovation Center at ITECC has supported more than 55 start-up companies in the region through its business incubator program. The program has also received $1.25 million from the U.S. Economic Development Administration to provide start-up companies with physical space and supportive services at a reduced cost.

The UT Brownsville School of Business and ITECC are primary sponsors of the Rio Grande Valley Business Plan Competition that offers a $7,000 cash prize to the winner. The competition was established to nurture the entrepreneurial spirit and promote the creation of innovative businesses in the Rio Grande Valley. This sponsorship is one example of UT Brownsville's commitment to the economic development of the region.

These investments in organizational and faculty excellence contribute to enhanced resources for faculty research projects, often tracked by the money spent to conduct the scientific investigations. Despite the difficulties at the national level to maintain federal funding, research expenditures at UT Brownsville have increased 1 percent between 2005 and 2007, while research expenditures from federal sources decreased 5 percent. Research expenditures from grants awarded by the National Institutes of Health (NIH) declined by 25 percent, although recent awards will likely reverse that decline in the near future. NIH funding makes up over one-half of all research expenditures from federal sources at UT Brownsville.

The National Science Foundation's Centers of Research Excellence in Science and Technology Award was presented to The Center for Gravitational Wave Astronomy. This $5.5 million award will be used to expand interdisciplinary research in gravitational wave astronomy.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is fundamental for institutional advancement. Resources include: world-class faculty, innovative buildings with advanced research laboratories and academic spaces, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. UT Brownsville has increased the number of tenured/tenure track faculty by 21 percent, or 56 people, since 2005. These faculty bring innovative ideas and unique expertise to UT Brownsville, further enhancing the competitive stature of the institution. STARS Plus awards were given to two faculty for recruitment to UT Brownsville's department of physics.

STARs Plus Faculty

Dr. Volker Quetschke was recruited from the University of Florida, where he was a research scientist working with the laser Interferometer Gravitational Wave Observatory.

Dr. Ahmed Touhami was recruited from a post-doctoral fellow position at the University of Guelph. Dr. Touhami was part of the polymer surface and interface group in the department of physics.

Infrastructure

New construction and renovation of state-of-the-art buildings create educational and research possibilities that drive the competitiveness initiative. UT Brownsville's research space increased 55 percent since 2005, adding over 2,600 square feet. The Competitiveness Initiative will add almost 60,000 gross square feet of space for the Science and Technology Learning Center. The Science and Technology Learning Center consists of almost 60,000 gross square feet of research laboratory and teaching space for the biomedical program, an emergency response center, and the expansion of the allied health department. This impressive $33.8 million project also incorporates general purpose administrative and student support office space and is expected to be complete in March 2011.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UT Brownsville raised almost $112,000 in STEMM-specific endowments since FY 2005 for student scholarships. Almost $8,000 is distributed for STEMM scholarships on an annual basis from these new endowments. STEMM-related allocations equal 29 percent of the total philanthropic distribution per year.

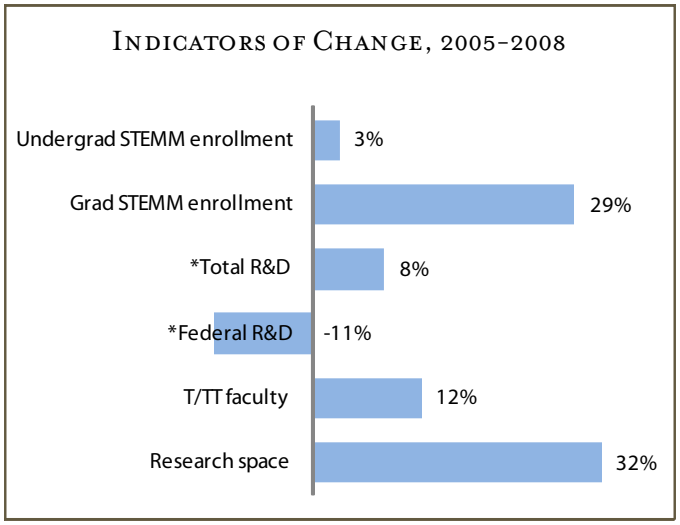
Faculty Awards

The faculty at UT Brownsville are often recognized for their significant contributions to their areas of expertise and respective fields of study.

Dr. Frederick Jenet, assistant professor of physics and astronomy, received a National Science Foundation CAREER award, a prestigious grant in support of junior faculty who effectively integrate innovative education and research. Dr. Jenet's research expertise is in pulsar timing and wave detection, using unique precision timing of radio pulsars to detect gravitational waves. The $620,000 award provided Brownsville with access to the world's largest radio telescope, the 1,000-foot Arecibo Observatory in Puerto Rico. The Arecibo Remote Command Center, established at UT Brownsville, allows Dr. Jenet and high school and college students to control the telescope from the institution.

The University of Texas at Dallas

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $66 million to strengthen competitiveness at UT Dallas. The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT Dallas at a Glance

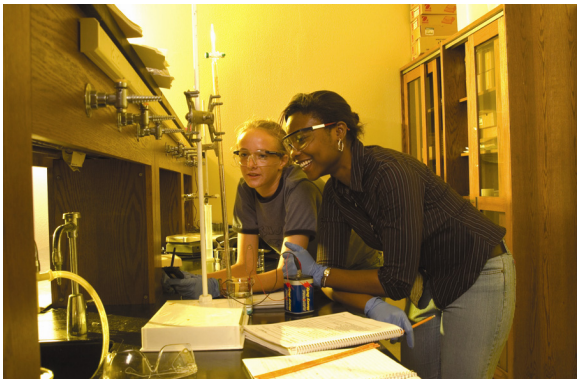
Student enrollment in STEMM, 2008	
Undergraduate (STEMM % of total)	3,108 (31%)
Graduate (STEMM % of total)	1,722 (35%)
New faculty recruited (2005-2008)	
STARs faculty recruited	8
ETF research superiority award recipients	1
Physical space (square footage)	
Teaching	283,000
Research	224,500
Increase in total sq. ft. through initiative	7%
New STEMM-related endowments (2005-2008)	$6 million
Research expenditures, 2008	$59 million
Federal research expenditures, 2008	$21 million
Intellectual property revenue, 2005-2008	$286 thousand
U.S. patents issued, 2005-2008	23
Licenses/options executed, 2005-2008	7
Start-up companies, 2005-2008	2

Education

Under the UT System Competitiveness Initiative, UT Dallas will increase its academic physical space by 74,000 square feet. Increases in classroom and research space have opened the door to many new degree programs. UT Dallas established four new STEMM degree programs in materials science and engineering and mechanical engineering. These expanded opportunities have allowed UT Dallas to set the goal of increasing its student enrollment to 22,000 over the next decade.

Approximately 1/3 of all undergraduate and graduate students enrolled at UT Dallas major in science, technology, engineering, math, and medical/health fields.

UT Dallas is focused on increasing educational opportunities in science, technology, engineering, math, and medical/health fields to overcome the workforce shortfall predicted in the RAGS report. Approximately one-third of all undergraduate and graduate students enrolled at UT Dallas major in STEMM fields. Undergraduate enrollment in STEMM has increased by almost 3 percent at UT Dallas since 2005 while overall undergraduate enrollment has remained essentially flat. This growth trend in STEMM enrollment is less than the 5 percent growth in undergraduate STEMM enrollment at all UT System academic institutions. Undergraduate student enrollment in health professions increased 17 percent, which is substantially higher than the 6 percent increase in health professions enrollment at all UT System academic institutions.



Graduate enrollment in STEMM fields has increased 29 percent since 2005, adding almost 390 additional students. This growth is larger than the overall graduate enrollment of 15 percent at UT Dallas. The rate of increase at UT Dallas is considerably larger than the 9 percent increase of STEMM graduate students enrolled at all UT System academic institutions while graduate enrollment for all majors increased by 4 percent. Graduate student enrollment in health professions programs decreased by

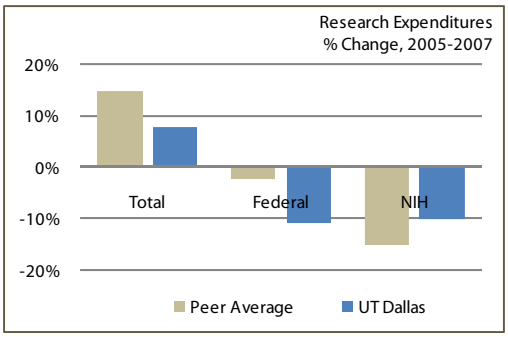
12 students (4%). This trend is significantly less than the 12 percent growth trend in health professions enrollment at all UT System academic institutions.

Research & Technology Development

UT Dallas has shown a firm commitment to creating an organizational structure that supports faculty research and commercialization activities. This commitment is essential for UT Dallas to meet its long-term goal of being a national research university. The university expanded research support and administration by creating several new positions. For example, a new position, Assistant Vice President of Research Development, was created to explore major interdisciplinary research proposals and to establish public-private research partnerships. Also, the Office of Technology Commercialization (OTC) was created to facilitate the launch of new enterprises through "virtual incubation," meaning that assistance is given to potential start-up companies without providing physical space. OTC works closely with the Institute for Innovation and Entrepreneurship, a catalyst for collaboration and alliances among faculty, researchers, students and the broader community in order to nurture a culture of creativity, innovation and exploration across UT Dallas.

The administrative support for commercialization has shown results. One of many examples is the atomically precise manufacturing program. The industry/government/university partnership to develop a new manufacturing process at the atomic level will result in device advances in the fields of telecommunications, data encryption, pharmaceuticals, genetics, military, and many others. UT Dallas' team, lead by the department of materials science and engineering professors Robert Wallace, K. J. Cho and Yves Chabal, will help advance this goal by concentrating on the precise control of material reactions on silicon during device assembly. The $15 million project is funded in part by the Defense Advanced Research Projects Agency and the Texas Emerging Technology Fund and includes partners at Zyvex Labs, University of Illinois at Urbana-Champaign, the University of North Texas, the National Institute of Standards and Technology, General Dynamics, Molecular Imprints, Inc., and Circuit Scanning Probe Instruments.

These investments in organizational structure contribute to enhanced resources for faculty research projects, often tracked by the money spent to conduct the scientific investigations. Research expenditures at UT Dallas have increased 8 percent between 2005 and 2007, while peers averaged a 15 percent increase. Research expenditures from federal sources decreased 11 percent during the same time period while peers averaged a 2 percent decrease. However, research grants awarded by the National Institutes of Health (NIH) decreased less than its peers: UT Dallas decreased by 10 percent and peers reported a 15 percent decrease. NIH funding increased 67 percent at UT Dallas from 2007 to 2008, while peers decreased 6 percent.



Source: NSF, NIH

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is fundamental for institutional advancement. Resources include: world-class faculty, innovative buildings with advanced research laboratories and academic spaces, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

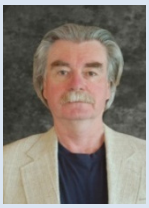
Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. UT Dallas has increased the number of tenured/tenure track faculty by 12 percent, or 41 people, since 2005. Eight faculty members were recruited through the STARs (Science and Technology Acquisition and Recruitment) Program, including one faculty member—Dr. Yves Chabal—who was also recruited as part of a Texas Emerging Technology Research Superiority award for Nanoelectronics.

STARs Faculty

Dr. Yves Chabal, one of the world's foremost authorities on semiconductor surfaces and materials, was recruited from Rutgers University where he was the director of the Laboratory for Surface Modification. At UTD he is the first to hold the Texas Instruments Distinguished University Chair in Nanoelectronics and is professor of materials science and engineering and physics.

Dr. Russell Hulse is associate vice president for strategic initiatives in the office of the president and professor of physics and science and mathematics education. Dr. Hulse received the Nobel prize in 1993 for one of the most significant scientific breakthroughs in the 20th Century. The detection of the first binary pulsar that enabled testing of Albert Einstein's general theory of relativity.

Dr. Kenneth O, Texas Instruments Distinguished Chair in Engineering, was recruited from the University of Florida. Dr. O will serve as the first director of the Texas Analog Center of Excellence (TxACE), a $16 million collaborative effort between the Semiconductor Research Corp., the Texas Emerging Technology Fund, Texas Instruments, the UT System, and UT Dallas.



Dr. John Oldow, head of the geosciences program and professor of structural geology and tectronics, was recruited from the University of Idaho. Dr. Oldow's research focuses on regional tectonics and processes related to active plate margins.

Dr. Denise Park is the T. Boone Pickens Distinguished Chair and UT Regents' Research Scholar and professor of behavioral and brain sciences. Dr. Park is an internationally renowned scholar in cognitive neuroscience, forging new territory in the understanding of brain function in memory and aging. Dr. Park was recruited from the University of Illinois at Urbana-Champaign to head the Productive Aging Laboratory in the Center for BrainHealth.

Dr. Myron Salamon, dean of the School of Natural Sciences and Mathematics and professor of physics, was recruited from the University of Illinois at Urbana-Champaign. Dr. Salamon plans to make the school a model for 21st Century academic research and education through an integrated, cross-disciplinary perspective.

Dr. Mark Spong, dean of the Erik Jonsson School of Engineering and Computer Science and Lars Magnus Ericsson Chair in Electrical Engineering, was recruited from the University of Illinois Urbana-Champaign. Dr. Spong's research focuses on robot control.

Dr. Li Zhang, Cecil H. and Ida Green Distinguished Chair in Systems Biology and chair of the department of molecular and cell biology, was recruited from Columbia University. Dr. Zhang's research focuses on environmental health sciences, such as reactions to environmental toxins at the cellular level.

Infrastructure

New construction and renovation of existing facilities to create state-of-the-art buildings provide educational and research possibilities that drive the competitiveness initiative. UT Dallas increased research space by 32 percent since 2005, adding almost 55,000 square feet with the completion of the Natural Sciences and Engineering Research Laboratory. In addition, the Competitiveness Initiative funded three new facilities: the Center for BrainHealth, the Math, Science, and Engineering Teaching-Learning Center, and the Vivarium and Experimental Space.

Competitiveness Initiative Supports $50 million for Capital Projects at UT Dallas

The Center for BrainHealth—winner of a 2009 Texas Society of Architects Design Award—is located in the Frances and Mildred Goad Building, an ultra-modern, 63,000-square-foot scientific institute that combines cutting-edge brain research with clinical interventions. The Center was originally funded by gifts totaling $700,000; additional giving has increased private support to $5 million. Innovative research and clinical services focus on brain disorders such as traumatic brain injury, stroke, autism, and Alzheimer's disease.

The Math, Science, and Engineering Teaching–Learning Center (MSET) is an integrated science and math teaching/learning building intended to provide a focused, high-quality education environment for math, science, and engineering undergraduate students. The 74,000 square foot facility is slated to serve as a major laboratory for research on effective teaching and learning techniques, both at the collegiate level and kindergarten through 12th grade. Construction is expected to total $30 million and be completed summer of 2010.

The Vivarium and Experimental Space for neuroscience and neuron-engineering faculty will be located in the basement of the Natural Sciences and Engineering Research Laboratory (NSERL). The $15 million project will complete 15,000 square feet of previous shell space. This project completes the NSERL building, a revolutionary, 192,000 square foot facility completed in 2007. The non-traditional building bears inspiring features such as overlapping anodized stainless steel pieces that reflect impressive color arrays and a façade with deep shadow boxes and cantilevered surfaces. The building's interior has open work stations equipped with large windows, encouraging cross-laboratory and cross-departmental collaboration where researchers can watch other scientists at work.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UT Dallas raised $6 million in STEMM-specific endowments since FY 2005, including graduate fellowships, distinguished chairs to support faculty research, and student scholarships. Over $650,000 is distributed for STEMM research and scholarships on an annual basis from these new endowments. STEMM-related allocations equal 80 percent of the total philanthropic distribution per year. In addition, UT Dallas raised $5 million in gifts to support the Center for BrainHealth, one of the construction projects for the UT Competitiveness Initiative.

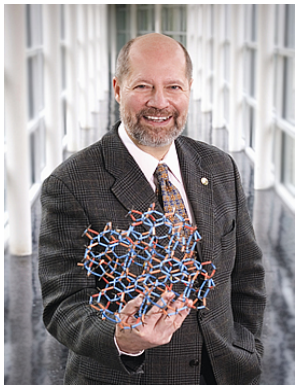
Since 2005, UT Dallas has raised $6 million for endowments supporting science, technology, engineering, math, and medical/health fields. UT Dallas has also raised $5 million in gifts to support construction of the Center for BrainHealth.

Faculty Awards

The faculty at UT Dallas are often recognized for their significant contributions to their areas of expertise and respective fields of study. The institution's competitive stature is enhanced by the recognition that these awards bring and the experiences that are then shared with students. For example, Dr. Ray Baughman was elected to the National Academy of Engineering for his contributions to the field of nanotechnology. Other National Academy members include NAE members Dr. David Daniel, president of UTD, and Dr. Don Shaw, emeritus professor of electrical engineering, and NAS member Dr. Brian Berry, dean of the School of Economic, Political, and Policy Sciences. Dr. Yang Liu received a National Science Foundation CAREER award, a prestigious grant in support of junior faculty who effectively integrate innovative education and research. Dr. Marion Underwood, Ashbel Smith Professor of Behavioral and Brain Sciences, received an Independent Scientist Career Award from the National Institutes of Health. Dr. Charles Bambach received a prestigious Fulbright Fellowship to lecture and research poetic justice in German philosophy at the University of Tuebingen in Germany. Dr. Daniel Wickberg, professor in the School of Arts and Humanities and expert in American cultural and intellectual history, was awarded a Fellowship by the National Endowment for Humanities.

Incentives

Various Systemwide initiatives and institutional programs provide additional incentives to excel in science, technology, engineering, math, and medical/health. The UT System's Chancellor's Entrepreneurship and Innovation Awards recognized Dr. Ray Baughman, Robert A. Welch Distinguished Chair in Chemistry and the director of the Alan G. MacDiarmid NanoTech Institute, for his discoveries in carbon nanotube yarns and sheets and artificial muscles powered by fuel cells. Dr. Baughman was elected into the National Academy of Engineering in 2008 and his inventions have led to 58 U.S. patents.



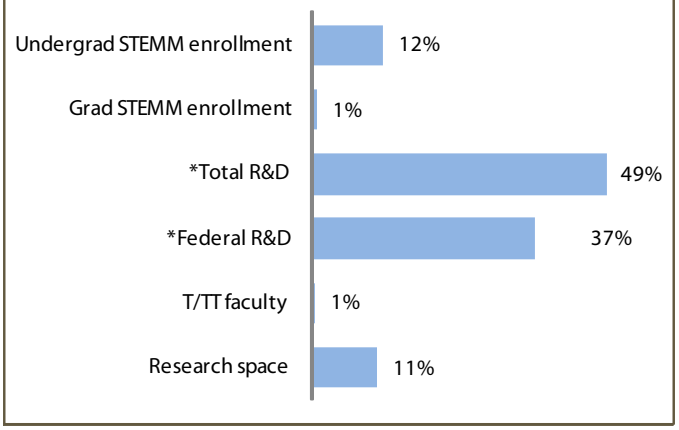
Dr. Ray Baughman

The UT System Texas Ignition Fund (TIF) is a seed-grant program to further develop inventions that need additional work to attract angel or venture capital investors and advance the invention's path toward the marketplace. The TIF has funded projects to commercialize two inventions at UT Dallas. First, the StoneMag System is expected to enable, for the first time, a surgeon to effectively and rapidly retrieve all stone fragments from a kidney, significantly reducing operation time, treatment costs and the morbidity of stone recurrences. Second, researchers developed a technology that accounts for patient movement during Magnetic Resonance Imaging (MRI), improving the precision of images and resulting diagnoses.

The University of Texas at El Paso

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $124 million to strengthen competitiveness at UT El Paso. The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.

Indicators of Change, 2005-2008



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT El Paso at a Glance

Student enrollment in STEMM, 2008	
Undergraduate (STEMM % of total)	3,881 (23%)
Graduate (STEMM % of total)	633 (19%)
New faculty recruited (2005-2008)	
STARs faculty recruited	10
ETF research superiority award recipients	1
Physical space (square footage)	
Teaching	538,500
Research	177,400
Increase in total sq. ft. through initiative	13%
New STEMM-related endowments (2005-2008)	$1.8 million
Research expenditures, 2008	$47.9 million
Federal research expenditures, 2008	$27.0 million
Intellectual property revenue, 2005-2008	$306 thousand
U.S. patents issued, 2005-2008	45
Licenses/options executed, 2005-2008	8
Start-up companies, 2005-2008	3

Education

Under the UT System Competitiveness Initiative, UT El Paso has increased its academic physical space by 264,000 square feet. Increases in classroom and research space have opened the door to many new degree programs. UT El Paso established three new degree STEMM programs in computational science, public health, and chemistry. These expanded educational programs have been further strengthened by adding a new associate vice provost for enrollment management.

Undergraduate enrollment in science, technology, engineering, and math fields has increased 12% since 2005. Graduate enrollment in STEMM has increased 2% though total graduate enrollment has declined by 2%.

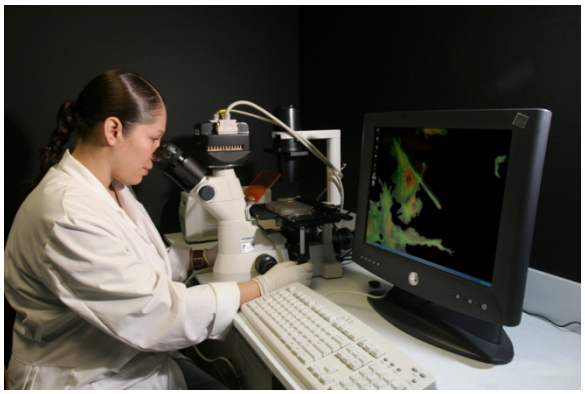
UT El Paso is focused on increasing student success in science, technology, engineering, math, and medical/health (STEMM) fields as suggested in the RAGS report, with an emphasis on recruiting, advising, and identifying financial aid for these students. Approximately one-fifth of all undergraduate and graduate students enrolled at UT El Paso major in STEMM fields. Undergraduate enrollment in STEMM has increased 12 percent at UT El Paso since 2005, which is more than double the overall undergraduate enrollment growth of 5 percent. UT El Paso's growth trend is higher than the 5 percent growth in undergraduate STEMM enrollment at all UT System academic institutions. Undergraduate enrollment in nursing programs decreased by 5 students (1%) and enrollment in health professions decreased by 140 students (40%). These trends are less than the 9 percent nursing enrollment increase and the 6 percent increase in health professions enrollment at all UT System academic institutions.

Graduate enrollment in STEMM fields has remained stable since 2005, adding an additional eight students, or 1 percent. This growth is less than the overall graduate enrollment of 9 percent at UT El Paso. The rate of increase at UT El Paso is less than the 8 percent increase of STEMM graduate students enrolled at all UT System academic institutions while graduate enrollment for all

majors increased by 4 percent. The success of these graduate students is enhanced by UT El Paso's Bridge to the Doctorate initiative to award scholarships to minority STEMM students. The initiative is funded by the UT System Louis Stokes Alliance for Minority Participation Program and is the only initiative to receive funding in 2009. Graduate student enrollment in nursing and health professions programs increased significantly, by 13 percent and 37 percent, respectively. Nursing graduate student enrollment at UT El Paso increased at approximately the same rate as all UT System academic institutions (13% and 12%, respectively). In contrast, graduate student enrollment in health professions grew significantly faster at UT El Paso (37%) than at all UT System academic institutions (12%).

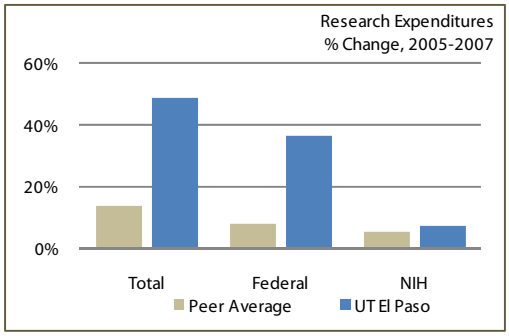
Research & Technology Development

UT El Paso continues to make strategic investments to enhance research initiatives, such as focusing its research efforts on multidisciplinary projects that are relevant to the Paso del Norte region. To demonstrate its commitment to enhance the region's economic development, UT El Paso has established the Kauffman Campus Initiative funded by the Ewing Marion Kauffman Foundation. Two centers have evolved to implement this initiative: the Center for Hispanic Entrepreneurship (CfHE) and the Center for Research Entrepreneurship and Innovative Enterprises (CREIE). CfHE Fellows work with students to develop and disseminate entrepreneurship educational materials specific to the Hispanic community. In addition to developing strategic partnerships, the CREIE provides commercialization consulting, coaching, and training.



Research expenditures at UTEP have drastically outpaced its peers in recent years. Total research expenditures increased by almost 50%; federal research expenditures by 37 %.

UT El Paso researchers contribute to the institution's economic development goals as well. For example, several faculty have discovered important inventions that have led to commercializable products. Dr. Anthony Tarquin has developed a cost-effective way to regain up to 85 percent of the water that would normally be thrown away during the water desalination process. While most desalination plants return the salt concentrate to the ocean, disposing of the remaining salt concentrate is a significant challenge for inland communities. Another innovative example is a light filter that Dr. Carl Dirk has developed that can protect delicate works of art from photochemical damage. The filter is being used by museums to enhance the way paintings are viewed while also protecting them from the slow deterioration of paint pigments and canvas materials due to light exposure.



Source: NSF, NIH.

These institutional investments in research contribute to enhanced resources for faculty research projects, often tracked by the money spent to conduct the scientific investigations. Research expenditures at UT El Paso have dramatically outpaced its peers between 2005 and 2007, with total research expenditures increasing almost 50 percent while peers averaged a 14 percent increase. Research expenditures from federal sources increased 37 percent during the same time period while peers averaged an 8 percent decrease. These advances in research activities bring UT El Paso closer to their long-term goal of becoming a top-tier research institution.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include: world-class faculty, innovative buildings with advanced research laboratories and academic spaces, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

The number of tenured/tenure track faculty has remained stable at UT El Paso since 2005. Twenty-one faculty members received a total of $7.2 million in awards from the STARs (Science and Technology Acquisition and Recruitment) Program, with 10 awards used for recruitment from other institutions and 11 awards used for faculty retention at UT El Paso. Ten of the 21 were faculty in engineering, nine were in natural sciences, and two were from psychology. In addition, one faculty member—Dr. Thomas Davis—was recruited through a Texas Emerging Technology Research Superiority award to lead the newly created Center for Inland Desalination Systems.

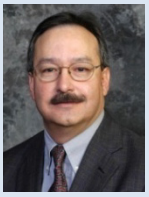
Dr. Thomas Davis, one of the nation's foremost desalination experts, was recruited from the University of South Carolina to lead the research and commercialization effort. The Center is partnering with El Paso Water Utilities and the U.S. Army to establish the Center and implement current desalination technology.

STARs Faculty

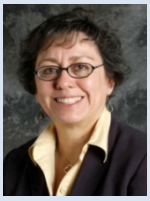
Dr. Renato Aguilera, professor of biological sciences and director of the cell culture and high throughput core facility of the Border Biomedical Research Center, was retained at UT El Paso. Dr. Aguilera is an expert in the degradation process of DNA and anti-cancer drug screening.

Dr. Edward Castañeda, chair and professor of psychology, was recruited from Arizona State University. Dr. Castañeda's research expertise is in the compensation of brain function following damage from drug addiction and brain injury.

Dr. Diane Doser, associate professor of geological sciences, was retained at UT El Paso to continue her research in earthquake seismology and environmental geophysics such as watershed studies and quality estimation of freshwater aquifers.



Dr. Jorge Gardea-Torresday, chair of the department of chemistry and Dudley Professor of Chemistry and Environmental Science and Engineering. Dr. Gardea-Torresday was retained at UT El Paso to continue his work in environmental chemistry, especially the investigation of the absorption of heavy metals into biomass and living plants.



Dr. Ann Quiroz Gates, associate vice president of research in the Office of Research and Sponsored Projects, was retained at UT El Paso. Dr. Gates directs the Cyber-ShARE Center, a center of excellence for innovative cyberinfrastructure used to advance education, interdisciplinary science, and engineering collaborations. Dr. Gates' research expertise is in grid computing and software fault monitoring.

Dr. Connie Gomez, assistant professor of mechanical engineering, was recruited from Drexel University where she received her Ph.D. Dr. Gomez's expertise is in interdisciplinary based design tools and bio-mechanical manufacturing systems.

Dr. June Kan-Mitchell, professor of biological sciences, was recruited from the department of immunology and microbiology and the Karmanos Cancer Institute at Wayne State University. Dr. Kan-Mitchell is internationally recognized for her research on underlying proteins in immunogenetics.

Dr. G. Randy Keller, professor emeritus of geological sciences, received a STARs award for retention. His research expertise is in seismic studies of major geological rifts, such as the Rio Grande and Kenya rifts.

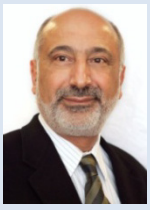
STARs Faculty

Dr. Vladik Kreinovich, professor of computer science, was retained at UT El Paso. Dr. Kreinovich's research expertise is in data processing algorithms and mathematical foundations of intelligent control.

Dr. Vinod Kumar, assistant professor of mechanical engineering, was recruited from Princeton University where he was senior research specialist in the Geophysical Fluid Dynamics Laboratory. Dr. Kumar's expertise is in computational, analytical, and experimental fluid dynamics and mechanics.

Dr. Kate Miller, professor of geological sciences was retained to continue her research on the application of active-source seismology to understand continental evolution and earthquake hazards.

Dr. Shizue Mito, assistant professor of chemistry, was recruited from a post-doctoral fellowship at Harvard University. Dr. Mito's research is focused on developing new reactions for the synthesis of bioactive compounds.



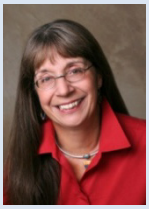
Dr. Soheil Nazarian, Mr. and Mrs. McIntosh Murchison IV Endowed Chaired Professor and director of the Center for Transportation and Infrastructure Systems was retained at UT El Paso. Dr. Nazarian's research focuses on the nondestructive testing of infrastructure.

Dr. Michele Nishiguchi, department of biological sciences, was recruited from New Mexico State University. Her research focuses on marine symbiosis, specifically the evolution of bacteria in host organisms. Dr. Nishiguchi joins UTEP in fall 2009.

Dr. Terry Pavlis, professor of geological sciences, was recruited from the University of New Orleans. His research focuses on structural geology and tectonics, such as the architecture of the earth's crust and strike-slip systems.

Dr. Wei Qian, professor of electrical and computer engineering and director of the Medical Imaging Informatics Program, was recruited from the University of South Florida. Dr. Qian's research focuses on medical imaging, especially at the cellular and molecular levels.

Dr. Richard Schoephoerster, dean of the college of engineering, was recruited from Florida International University where he established and served as the initial director of the Cardiovascular Engineering Center. He also established and served as the initial director of the Biomedical Engineering Institute, which was converted to a department, where Dr. Schoephoerster served as founding chair.



Dr. Patricia Teller, professor of computer science was retained at UT El Paso to continue her research on computer operating systems and computer architecture.

Dr. Ryan Wicker was retained as the Mr. and Mrs. MacIntosh Murchison Professor of Mechanical Engineering and director of the W. M. Keck Border Biomedical Manufacturing and Engineering Laboratory. Dr. Wicker's research focuses on the development of multi-material stereolithography technology.

Dr. Chuan Xiao, assistant professor of chemistry, was recruited from a post-doc fellowship at Purdue University. His research focuses on the structure of viruses and plant proteins, using x-ray crystallography and cryo-electron microscopy.

Dr. Michael Zarate, professor of psychology, was retained to continue his research on social cognitive processes that underlie prejudice and stereotyping.

Infrastructure

New construction and renovation of existing facilities to create state-of-the-art buildings provide educational and research possibilities that drive the competitiveness initiative. UT El Paso increased research space by 11 percent since 2005, adding almost 17,000 square feet. In addition, the UT Competitiveness Initiative funded one new facility, the Physical Sciences/ Engineering Core Facility, and renovations to the Science and Engineering Core Facilities.

Competitiveness Initiative Provides $113 million for Capital Projects at UT El Paso

The Physical Sciences/Engineering Core Facility is a new state-of-the-art undergraduate laboratory and teaching facility for the chemistry and physics departments. The $85 million project is expected to be completed in the summer of 2011.

The Science and Engineering Core Facilities Upgrade will renovate the existing Physical Sciences Building, the Engineering Science Complex, and finish out the remaining shelled portions of the existing Biosciences Research Building. The $28 million project is expected to be complete in late 2011.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UT El Paso raised $1.8 million in STEMM-specific endowments since FY 2005, including graduate fellowships, distinguished chairs to support faculty research, and student scholarships. Approximately $83,000 is distributed for STEMM research and scholarships on an annual basis. STEMM-related allocations equal 41 percent of the total philanthropic distribution per year.

Faculty Awards

The faculty at UT El Paso are often recognized for their significant contributions to their areas of expertise and respective fields of study. The institution's competitive stature is enhanced by the recognition that these awards bring and the experiences that are then shared with students. For example, Dr. Bridget Smith-Konter, geological sciences, and Dr. Juan Noveron, chemistry, each received a prestigious National Science Foundation CAREER award, a prestigious grant in support of junior faculty who effectively integrate innovative education and research. Dr. Robert Anders, dean of the School of Nursing, was named a Fellow of the American Academy of Nursing for his leadership in education, management, practice, and research. Other major awards recently received by faculty are:

- 4 Fulbright American Scholar Fellowships: Dr. Judith Munter, associate dean in the college of education, Dr. Carol Clark, associate professor of English, Dr. Godwin Udo, professor and chair in the department of information and decision sciences, and Dr. William Robertson, assistant professor of teacher education
- 2 National Endowment for Humanities Awards: Dr. Howard Campbell, professor of sociology and anthropology, and Dr. Sandra Deutsch, professor of history
- 1 National Endowment for Humanities Fellowship: Dr. Robert Bledsoe, professor emeritus of English

These awards are some examples of the many ways in which UT El Paso's faculty are recognized for their leadership in research and education.

Incentives

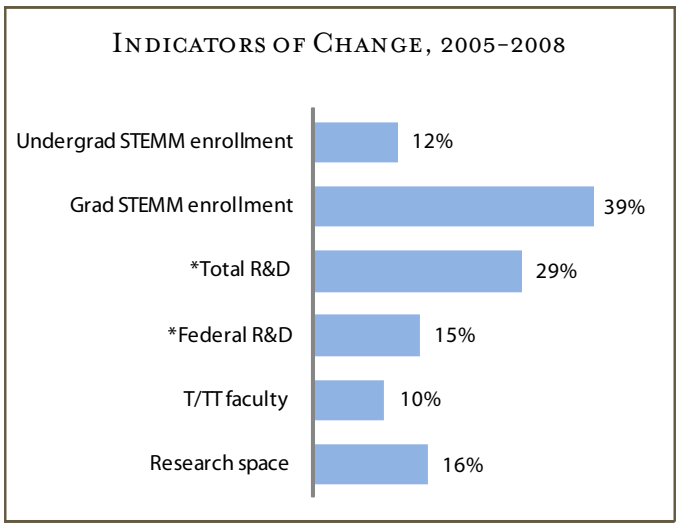
Various Systemwide initiatives and institutional programs provide additional incentives to excel in science, technology, engineering, math, and medical/health. The UT System's Chancellor's Entrepreneurship and Innovation Awards recognized Dr. Russell Chianelli, Professor of Materials Science and Engineering and Director of the Material Research and Technology Institute, for his discoveries in material science and energy. Dr. Chianelli's inventions have led to three U.S. patents and two spin-out companies: Mayan Pigments, Inc., and Refinery Science Corporation. Mayan Pigments also received $1 million from the Texas Emerging Technology Fund to assist moving the Mayan-inspired organic/inorganic hybrid pigments out of the lab and into the consumer market.

Dr. Russell Chianelli

The UT System Texas Ignition Fund has funded one invention at UT El Paso to commercialize a novel inhibitor for the prevention of organ or tissue rejection following a transplant.

The University of Texas – Pan American

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $11 million to strengthen competitiveness at UT Pan American. The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT Pan American at a Glance

Student enrollment in STEMM, 2008	
Undergraduate (STEMM % of total)	2,228 (15%)
Graduate (STEMM % of total)	239 (11%)
New faculty recruited (2005-2008)	43
Physical space (square footage)	
Teaching	449,700
Research	56,400
Increase in total sq. ft. through initiative	2%
New STEMM-related endowments (2005-2008)	$471,000
Research expenditures, 2008	$8.5 million
Federal research expenditures, 2008	$4.7 million
Intellectual property revenue, 2005-2008	$6 thousand
New invention disclosures, 2005-2008	32

Education

UTPA's innovative solutions to challenges in education are positively impacting student enrollment in critical fields. Undergraduate enrollment in science, technology, engineering, and math majors has increased 12% since 2005.

Under the UT System Competitiveness Initiative, UT Pan American added five new STEMM degree programs: a Bachelor's of Science in environmental science and computer engineering and a Master's of Science in chemistry, engineering management, and physician assistant programs. The challenge for these new degree programs is that the physical classroom space has declined at UT PanAm. In fact, over 8,000 square feet of academic square feet has been lost since 2005. For this reason, the investments in physical infrastructure made by the UT System Competitiveness Initiative are critical to support the current momentum to meet the educational and research missions of the institution.

UT Pan American has declared as a top priority an increase in STEMM, nursing, and allied health graduates at all degree levels. To help meet that goal, UT PanAm has implemented the Sophomore Academic Mentoring (SAM) Program to increase retention of sophomores to juniors. In fall 2005, 58 percent of sophomores were retained for their junior year, up almost 6 percent from fall 2004. The goal is a 70 percent retention rate by 2010. UT Pan American has hired 150 SAM mentors, impacting 2,250 students per year.

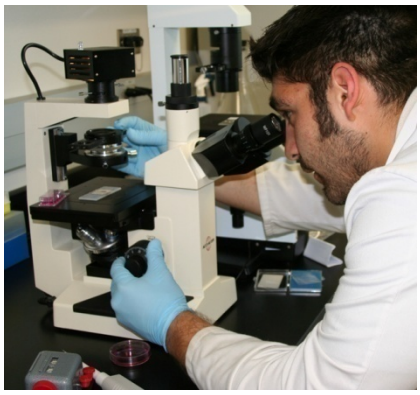
A related priority for UT Pan American is to implement the Quality Enhancement Plan (QEP), *"Engaging Learning for Mexican American Students in Gatekeeper Mathematics Courses."* The focus on a series of three algebra courses at UT Pan American was selected because these courses posed the most difficult challenge for undergraduate students among all classes offered. The QEP committee suggested that student success will improve with enhanced curriculum, student support, and faculty development. In 2005, the pass rate for the intermediate gatekeeper algebra course was 47 percent, up from 37 percent the year before. The goal is a 70 percent pass rate in 2010.

These innovative solutions to challenges in education are positively impacting student enrollment in STEMM disciplines. Undergraduate enrollment in STEMM has increased 12 percent at UT PanAm since 2005 while enrollment in all disciplines has increased only 3 percent. This growth trend is more than double the 5 percent growth in undergraduate STEMM enrollment at all UT System academic institutions. Undergraduate enrollment in nursing demonstrated remarkable growth, increasing by 25 percent (217 students), and bringing enrollment to almost 1,090 students in 2008. This growth makes it the second largest undergraduate nursing program within UT System academic institutions. Likewise, undergraduate enrollment in health professions increased 21 percent (213 students), totaling over 1,200 students in 2008. This growth makes it the largest undergraduate health professions program within UT System academic institutions. These increases are significantly higher than the 9 percent nursing enrollment increase and the 6 percent increase in health professions enrollment at all UT System academic institutions.

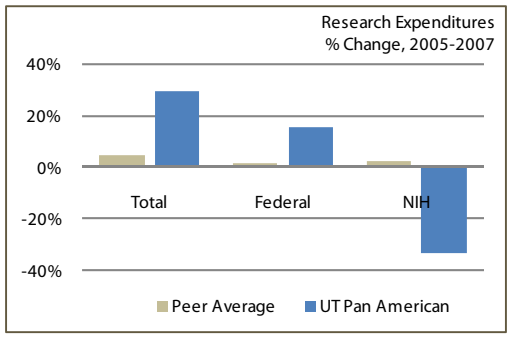
Graduate enrollment in STEMM fields has shown sizable growth, increasing 39 percent since 2005, adding an additional 67 students. This growth is substantially larger than UT Pan American's growth in overall graduate enrollment, which increased by 4 percent. The rate of increase at UT Pan American is considerably larger than the 9 percent increase of STEMM graduate students enrolled at all UT System academic institutions while graduate enrollment for all majors increased by 4 percent. Graduate student enrollment in nursing has remained relatively stable while nursing graduate student enrollment increased by 12 percent at all UT System academic institutions. Health professions graduate student enrollment at UTPA increased significantly faster than at all UT System academic institutions: 34 percent and 12 percent, respectively.

Graduate enrollment in STEMM has increased 39% since 2005, compared to an increase of 4% for all graduate enrollment.

Research & Technology Development



The University has invested in its research enterprise by providing faculty with significant training opportunities to support proposal development, grant management, and research compliance. Faculty have resources available to help them manage the entire range of extramural funding activities, from locating grant opportunities that match their research interests to developing the final report after the grant has ended. Assistance is also provided to support faculty in technology transfer and entrepreneurship. Podcast and video presentations are available online and an annual "entrepreneurship bootcamp" helps ensure that faculty members have the resources necessary to develop their innovative ideas into marketable products that benefit the region, state, and world.



Source: NSF, NIH

UT Pan American has provided another resource for their faculty by becoming a partner in the UT System South Texas Technology Management (STTM) office. The office, housed at UT Health Science Center at San Antonio, provides technology management services for UT Pan American as well as UT Brownsville and UT San Antonio. This partnership complements the university's staff in the Office of Innovation and Intellectual Property, who work directly with faculty and students to protect intellectual property and advance economic development for the region. The STTM provides consultation as needed for a wide variety of intellectual property issues.

These investments in organizational resources support faculty research projects, often tracked by the money spent to conduct the scientific investigations. Research expenditures at UTPA have increased at a significantly faster rate than peer institutions, totaling 29 percent between 2005 and 2007, while peers averaged a 5 percent increase. Research expenditures from federal sources increased 15 percent during the same time period while peers averaged a 1 percent increase. UTPA has made a commitment to supporting faculty research efforts, which will help the institution reach its goal of $10 million in research expenditures by 2010.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is fundamental for institutional advancement. Resources include: world-class faculty, innovative buildings with advanced research laboratories and academic spaces, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. UTPA has increased the number of tenured/tenure track faculty by 10 percent, or 43 people, since 2005.

Infrastructure

UTPA increased research space almost 16 percent since 2005, adding over 7,500 square feet. In addition, the Competitiveness Initiative supported four new facilities and one major renovation: the Science Building Renovation, the Student Health Clinic, the Starr County Upper Level Center, the Animal Research Facility, and the Fine Arts Academic and Performance Center.

Competitiveness Initiative Supports $11 million for Capital Projects at UT Pan American

The Science Building Renovation completed 13,500 square feet of the previously "shelled" third floor to house two research laboratories, four teaching laboratories, and 24 faculty offices. The $2 million project was completed in fall of 2006, funded by the Higher Education Assistance Fund and tuition revenue bonds.

The Animal Research Facility construction will make a more technologically adequate area in the new Regional Academic Health Center that was constructed by the UT Health Science Center at San Antonio. Construction of the 20,000 square feet facility is currently on hold and is expected to total $16.4 million.

The Fine Arts Academic and Performance Center will add space for academic studies in the Fine Arts and for performing arts and other University and community events. The $49.7 million project is currently in the pre-planning phase and the project is expected to be complete in the spring of 2014.

The Starr County Upper Level Center is a satellite center of UT Pan American, offering upper division and graduate level coursework through on-campus and distance education courses in almost 18,000 square feet of space. The $7.5 million Center is located in the southwestern part of the Rio Grande Valley, adjacent to the South Texas College campus in Rio Grande City. Construction is expected to be completed in fall 2010.

The Student Health Clinic replaces the former clinic in order to accommodate the campus's growing needs. The $1.4 million new Clinic consists of 7,300 square feet and was built in conjunction with the new Wellness and Recreation Sports Center. Construction of the facility was complete in fall 2007.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UT Pan American raised over $471,000 in STEMM-specific endowments since FY 2005, particularly for student scholarships. Over $7,700 is distributed for STEMM scholarships on an annual basis. STEMM-related allocations equal 8 percent of the total philanthropic distribution per year.

Faculty Awards

The faculty at UT Pan American are often recognized for their significant contributions to their fields of study. The institution's competitive stature is enhanced by the recognition that these awards bring and the experiences that are then shared with students.

Award-Winning Faculty

Dr. Deborah Cole, assistant professor of english, was named a Fulbright American Scholar to create effective synergies across continents through lectures, teaching, and conducting research. Dr. Cole's expertise is in multilingualism and cultural diversity and comparative language ideologies. Her Fulbright studies were conducted at Gadjah Mada University in Yogyarkarta, Indoniesia.

Dr. Bin Fu, assistant professor of computer science, received a CAREER award from the National Science Foundation, a prestigious grant in support of junior faculty who effectively integrate innovative education and research. Dr. Fu has made significant contributions in bioinformatics (protein folding), algorithms (width-bounded separator theory, Rocchio's relevance feedback algorithm analysis, and Abelian group factorization), complexity theory, and molecular computing.

Dr. Monica Diaz, assistant professor of modern languages and literature, was named a fellow of the National Endowment for Humanities. The research award supported a project on the lives and writings of indigenous nuns in Colonial Mexico. Dr. Diaz specializes in Latin American colonial culture and literature.

Dr. Ethan Sharp, assistant professor of modern languages and literature, was named a Fulbright American Scholar to conduct research in Mexico. The focus of Dr. Sharp's research is the expanding drug addiction treatment programs in Monterrey and the focus on spirituality in the treatment process.

Incentives

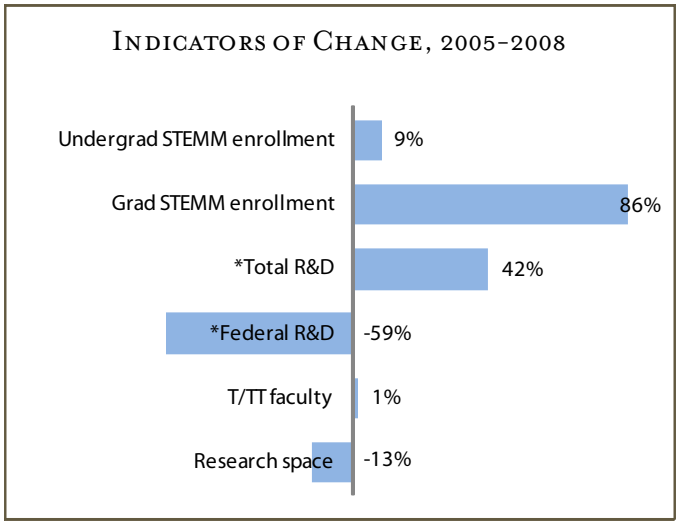
Various Systemwide initiatives and institutional programs provide additional incentives to excel in science, technology, engineering, math, and medical/health fields.

The UT System's Chancellor's Entrepreneurship and Innovation Awards recognized Dr. Banglin Chen, associate professor of chemistry, for his discoveries in hydrogen storage technology and nanoporous metal-organic supramolecules and frameworks. Dr. Chen's inventions are important to solve the challenge of gas storage.

The UT System Texas Ignition Fund (TIF) is a seed-grant program to further develop inventions that need additional work to attract angel or venture capital investors and advance the invention's path toward the marketplace. The TIF has funded Dr. Karen Lozano's project to commercialize a simplified nanomanufacturing process and a prototype research scale device to enhance research production of a variety of nanofibers resulting in lower nanofiber costs, higher yield, and increased processing safety. Dr. Lozano is associate professor of mechanical engineering at UT Pan American.

The University of Texas of the Permian Basin

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $136 million to strengthen competitiveness at UT Permian Basin. The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT Permian Basin at a Glance

Student enrollment in STEMM, 2008	
Undergraduate (STEMM % of total)	466 (17%)
Graduate (STEMM % of total)	26 (4%)
Physical space (square footage)	
Teaching	102,000
Research	11,000
Increase in total sq. ft. through initiative	97%
New STEMM-related endowments (2005-2008)	$339,000
Research expenditures, 2008	$3 million
Federal research expenditures, 2008	$314,000
New invention disclosures, 2005-2008	2
U.S. patents issued, 2005-2008	1

Education

Under the UT System Competitiveness Initiative, UT Permian Basin increased its academic physical space by almost 128,000 square feet. Increases in classroom and research space have opened the door to two new degree programs in mechanical engineering and computer science. These expanded opportunities have allowed UTPB to set a goal of increasing their student enrollment by 5.5 percent.

UT Permian Basin is focused on increasing educational opportunities in science, technology, engineering, math, and medical/health (STEMM) fields to overcome the workforce shortfall predicted in the RAGS report. A major institutional initiative is to enhance the STEMM program with new degrees in chemical and electrical engineering. The initiative is expected to provide an increase in STEMM graduates for the region, reaching 350 students by 2015.

Another initiative is to increase the national recognition of program quality at UT Permian Basin. Four specialized programs have earned accreditation, and UTPB is now included in the survey for the *U.S. News & World Report* business school rankings. National recognition may also increase with new admission standards that will be implemented in fall, 2009.

Undergraduate enrollment in STEMM fields has increased by almost 9% since 2005 at UTPB. In 2008, approximately 17% of undergraduates were STEMM majors.

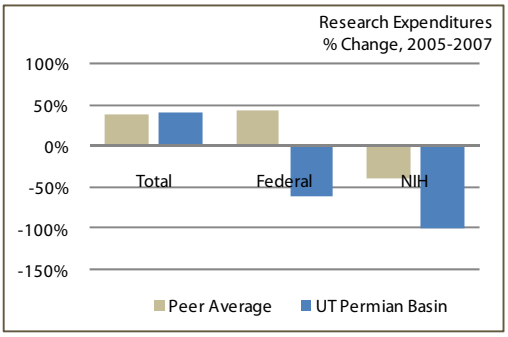
Approximately 17 percent of undergraduate students enrolled at UT Permian Basin major in STEMM fields. Undergraduate enrollment in STEMM has increased by almost 9 percent at UTPB since 2005, while overall undergraduate enrollment has declined by four percent. This growth trend in STEMM enrollment is more than the 5 percent growth in undergraduate STEMM enrollment at all UT System academic institutions.

Graduate enrollment in STEMM fields has increased 86 percent since 2005, adding 12 students. This growth is more than the overall graduate enrollment increase of 45 percent at UT Permian Basin. The rate of increase at UTPB is considerably larger than the 9 percent increase of STEMM graduate students enrolled at all UT System academic institutions while graduate enrollment for all majors increased by 4 percent.

Research & Technology Development

UT Permian Basin has set a goal of increasing sponsored research at the institution. In support of this goal, the institution enhanced its research support for faculty and increased faculty expectations for research productivity.

These institutional enhancements contribute to improved resources for faculty research projects, often tracked by the money spent to conduct the scientific investigations. Research expenditures at UT Permian Basin have increased 42 percent between 2005 and 2007, while peers averaged a 39 percent increase. Research expenditures from federal sources decreased 59 percent during the same time period while peers averaged a 45 percent increase. Similarly, research expenditures from grants awarded by the National Institutes of Health (NIH) decreased more than its peers: UT Permian Basin decreased by 100 percent and peers reported a 40 percent decrease. It is important to note that the largest funding source for research at UTPB is from the institution (43% in 2007), far exceeding federal, state, and private funding sources.



Source: NSF, NIH.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is fundamental for institutional advancement. Resources include: world-class faculty, innovative buildings with advanced research laboratories and academic spaces, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. UT Permian Basin has increased the number of tenured/tenure track faculty by 1 percent, or one person, since 2005. The institution plans to increase the number of new faculty positions in STEMM fields by seven over the next two years.

Infrastructure

New construction and renovation of state-of-the-art buildings create educational and research possibilities that drive the institution's competitive prominence. UT Permian Basin decreased research space by 13 percent since 2005, losing over 1,600 square feet. The Competitiveness Initiative will help offset this loss with the completion of the Science and Technology Complex. In addition, the Wagner Noël Performing Arts Center will add space for classrooms, a recital hall, and an auditorium.

Competitiveness Initiative Supports $135 million for Capital Projects at UT Permian Basin

The Science and Technology Complex includes construction of 117,000 square feet of space for undergraduate and graduate teaching and research. In addition to laboratories, lecture halls, and general office space, campus wide information systems support will be housed here. The $54 million project is funded through tuition revenue bonds and is expected to be complete in fall 2010.

The Wagner Noël Performing Arts Center includes almost 65,000 assignable square feet of space that will be used for a performing arts center, classroom spaces, and a convocation center for various University functions. The $81 million project includes $45 million in tuition revenue bonds, $16 million in gifts, $12.5 million in Permanent University Fund bonds and $7.5 million in grants.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UT Permian Basin raised almost $339,000 in endowments since FY 2005 to support student scholarships. Over $2,700 is distributed for scholarships on an annual basis.

Faculty Awards

The faculty at UT Permian Basin are often recognized for their significant contributions to their fields of study. The institution's competitive stature is enhanced by the recognition that these awards bring and the experiences that are then shared with students.

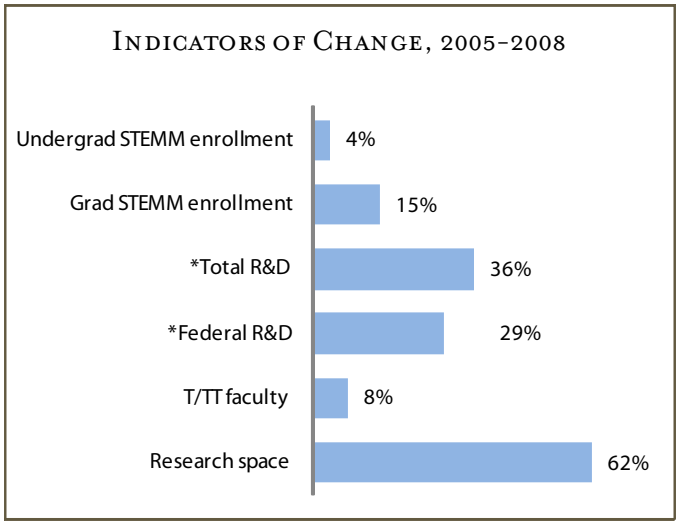
Dr. Marianne Berger Woods, assistant professor in the department of visual and performing arts, was named a Fulbright American Scholar to create effective synergies across continents through lectures, teaching, and conducting research. Dr. Woods provided lectures on the cross-fertilization of ideas in American and Russian visual arts and literature at the Moscow State Pedagogical University in Moscow, Russia.

Incentives

Various programs provide additional incentives to excel in science, technology, mathematics, and health. The UT System's Chancellor's Entrepreneurship and Innovation Awards recognized Dr. James Wright for his discoveries in nuclear chemistry and mathematical modeling. Dr. Wright serves as UT Permian Basin's director of the High-Temperature Teaching and Test Reactor (HT^3R) project.

The University of Texas at San Antonio

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $109 million to strengthen competitiveness at UT San Antonio. The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT San Antonio at a Glance

Student enrollment in STEMM, 2008	
Undergraduate (STEMM % of total)	6,427 (26%)
Graduate (STEMM % of total)	885 (25%)
New faculty recruited (2005-2008)	
STARs faculty recruited	9
ETF research superiority award recipients	1
Physical space (square footage)	
Teaching	546,000
Research	178,900
Increase in total sq. ft. through initiative	12%
New STEMM-related endowments (2005-2008)	$1.8 million
Research expenditures, 2008	$34.6 million
Federal research expenditures, 2008	$22.6 million
U.S. patents issued, 2005-2008	5
New invention disclosures, 2005-2008	44

Education

Under the UT System Competitiveness Initiative, UT San Antonio increased its academic physical space by 18,000 square feet. Increases in classroom and research space have opened the door to two new STEMM degree programs in computer engineering and advanced manufacturing and enterprise engineering. These expanded opportunities are closely aligned with UT San Antonio's enrollment management plan that includes raised freshman admission criteria, enrollment partnerships with community colleges, and enhanced financial support of undergraduate students.

About 1/4 of all undergraduate and graduate students at UTSA are enrolled in science, technology, engineering, and math fields.

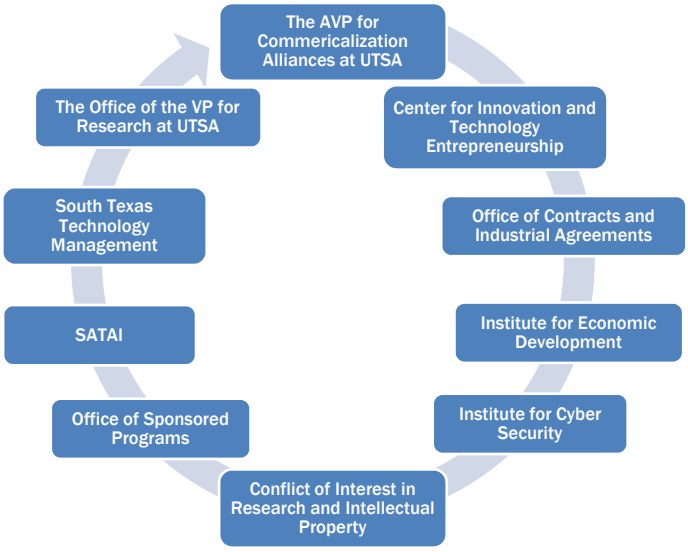
The enrollment plan is positively impacting student enrollment in STEMM disciplines as well. Approximately one-quarter of all undergraduate and graduate students enrolled at UTSA major in science, technology, engineering, or math fields. Undergraduate enrollment in STEMM has increased 4 percent at UTSA since 2005. This growth trend is close to the 5 percent growth in undergraduate STEMM enrollment at all UT System academic institutions.

Graduate enrollment in STEMM fields has increased 15 percent since 2005, adding an additional 113 students. This growth is substantially larger than UT San Antonio's overall graduate enrollment, which increased by 2 percent. The rate of increase at UTSA is considerably larger than the 9 percent increase of STEMM graduate students enrolled at all UT System academic institutions while graduate enrollment for all majors increased by 4 percent.

Research & Technology Development

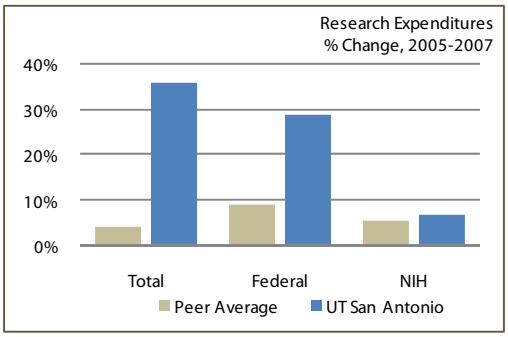
The University has invested in its research administration by recruiting experienced leaders in research administration and technology transfer. Improved organizational support for sponsored programs was established through the hiring of an experienced, nationally recognized leader as Senior Associate Vice President for Research. In addition, internal evaluations of research centers led to the development of new institutional policies, a reorganization of the centers, and a new networking framework for center directors. These substantial investments contribute to UT San Antonio's goal of becoming a premier research university.

UT San Antonio has recently implemented two internal research grant competitions to advance institutional research goals. The Collaborative Research Seed Grant Program provides up to $30,000 per project and four projects were funded in May 2009. In addition, the Tenure-Track Research Award Competition provides $22,000 per project and funded five projects in May 2009.



UTSA Technology Commercialization Ecosystem

Research at UT San Antonio often results in discoveries that could impact the global marketplace. UTSA is committed to enabling technology-based economic development. UT San Antonio is part of a technology commercialization ecosystem that includes pure, applied, and translational research, intellectual property creation and licensing, and company formation, funding, education, staffing, and incubation. The UTSA Commercialization Council, under the direction of the newly created position of the Assistant Vice President for Commercialization Alliances and Innovation, serves as the focal point for these activities at UT San Antonio. The diagram (*left*) shows how the commercialization ecosystem, through the University's Commercialization Council, works together at UT San Antonio.



Source: NSF, NIH.

These investments in organizational structure contribute to enhanced resources for faculty research projects, often tracked by the money spent to conduct the scientific investigations. Research expenditures at UTSA have increased at a significantly faster rate than peer institutions, totaling 37 percent between 2005 and 2007, while peers averaged a 4 percent increase. Research expenditures from federal sources increased 29 percent during the same time period while peers averaged a 9 percent increase. UTSA has made a commitment to becoming a premier research institution, demonstrated by increased collaborations with the UT Health Science Center at San Antonio, Southwest Research Institute, and the Southwest Foundation for Biomedical Research.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include: world-class faculty, innovative buildings with advanced research laboratories and academic spaces, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

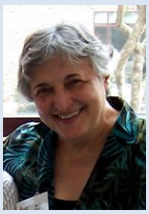
Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. UTSA has increased the number of tenured/tenure track faculty by 8 percent since 2005. Nine of these faculty were recruited and one world-renowned faculty member was retained through the STARs (Science and Technology Acquisition and Recruitment) Program.

Dr. Ravi Sandhu was recruited from George Mason University to create and direct the Institute for Cyber Security as the recipient of a Texas Emerging Technology Research Superiority award as the Luther Brown Endowed Chair in Cyber Security and professor of computer science.

STARs Faculty

Dr. Garry Cole, Professor and Margaret Batts Tobin Endowed Chair in Medical Mycology in the department of biology, was recruited from the Medical University of Ohio. Dr. Cole is an expert in medical mycology, or the study of fungus as related to vaccine development.

Dr. Thomas Forsthuber, professor of immunology in the department of biology, was recruited from Case Western Reserve University and studies immunology and autoimmune diseases.



Dr. Rena Bizios, Peter Flawn Professor, department of biomedical engineering, was recruited from Rensselaer Polytechnic Institute. Dr. Bizios is an award-winning researcher in cellular and tissue engineering and tissue regeneration.

Dr. Frank Chen, Lutcher Brown Distinguished Chair in Advanced Manufacturing, department of mechanical engineering and Director of the Center for Advanced Manufacturing and Lean Systems, was recruited from Virginia Tech where he founded and led the Center for High Performance Manufacturing. Dr. Chen's research is in the design and analysis of flexible manufacturing systems.

Dr. Ruyan Guo, Robert E. Clarke Endowed Professor of Electrical and Computer Engineering was recruited from Pennsylvania State University. Dr. Guo is internationally recognized for her distinguished career in electronic and optical materials research and was most recently named a SPIE fellow, the international society for optics and photonics.

Dr. Mo Jamshidi, Lutcher Brown Endowed Chair in the department of electrical and computer engineering was recruited from the University of New Mexico to serve as the director of the Autonomous Control Engineering (ACE) Center. Dr. Jamshidi's research expertise is in large-scale systems and computational intelligence, focusing on robotic mobile rovers for exploration of unstructured environments like planets. Several federal agencies have benefitted from Dr. Jamshidi's expert advice, such as the US Air Force, the Department of Energy, and NASA.

Dr. Donald M. Kurtz, Jr., Lutcher Brown Distinguished Endowed Chair in the department of chemistry, was recruited from the University of Georgia where he was Distinguished Research Professor of Chemistry and Biochemistry and Molecular Biology. Dr. Kurtz is a researcher in bioinorganic chemistry.

Dr. Efstathios Michaelides, professor and chair of mechanical engineering, was recruited from the University of North Texas. Dr. Michaelides is an expert in thermodynamics of advanced energy conversion devices, energy systems, and energy conservation and has received numerous awards for teaching excellence.

Dr. George Perry, Dean of the College of Sciences and Professor of Biology, was recruited from Case Western Reserve in 2005 and received a STARs award to stay at UTSA. Dr. Perry is a pathologist and one of the top 20 researchers in Alzheimer's disease.

Dr. Zenong Yin, Jeff and Loretta Clarke Endowed Professor of Health in the department of health and kinesiology, was recruited from the Medical College of Georgia where he served as a professor of pediatrics in the Georgia Prevention Institute. Dr. Yin is an expert in disease prevention programs in school and community settings, particularly targeting childhood diabetes.

Infrastructure

New construction and renovation of existing facilities to create state-of-the-art buildings provide educational and research possibilities that drive the competitiveness initiative. UTSA increased research space by 62% since 2005, adding over 68,000 square feet. In addition, the Competitiveness Initiative funded two new facilities: the second phase of the Biotechnology, Sciences, and Engineering (BSEII) Building and renovations of the Science Facility at the 1604 Campus. The BSEII Building (*right*) adds 150,000 square feet of research and teaching space, featuring the most sophisticated technology for an information-intensive environment. Science Facility renovations at the 1604 Campus will improve research and teaching space at the physical science laboratory, earth and life science laboratory, and the small animal laboratory. This project is currently in the planning stages and is expected to be completed in the summer of 2010.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UTSA raised $1.75 million in STEMM-specific endowments since FY 2005, including distinguished chairs to support faculty research in biology and engineering. Over $50,000 is distributed for STEMM research and scholarships on an annual basis. STEMM-related allocations are nearly one-fifth of the total philanthropic distribution per year.

Faculty Awards

The faculty at UTSA are often recognized for their significant contributions to their fields of study. The institution's competitive stature is enhanced by the recognition that these awards bring and the experiences that are then shared with students. For example, Dr. Rena Bizios received the 2009 Distinguished Scientist Award of the Houston Society for Engineering in Medicine and Biology for her pioneering contribution to the field of cellular engineering. Two faculty members were named Fulbright American Scholars to create effective synergies across continents through lectures, teaching, and conducting research: Dr. Richard Jones, professor of geography, was a scholar to Bolivia and Dr. Jeanne Campbell Reesman, professor of American literature, was a scholar to Greece. Five faculty received CAREER awards from the National Science Foundation, a prestigious grant in support of junior faculty who effectively integrate innovative education and research: Dr. Yufei Huang, associate professor of electrical and computer engineering; Dr. Carola Wenk, associate professor of computer science; Dr. Hai-Chao Han, associate professor of mechanical engineering; Dr. Daniel Jimenez, associate professor of computer science; and Dr. Qing Yi, assistant professor of computer science. These awards are some examples of the many ways in which UTSA's faculty are recognized for their leadership in research and education.

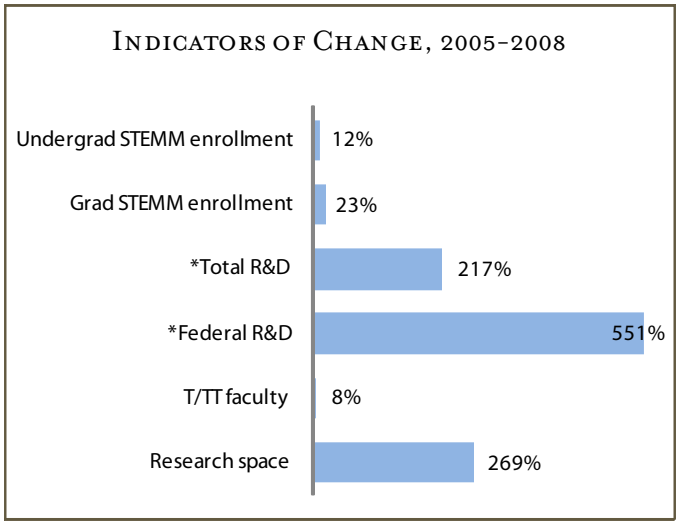
Incentives

Dr. Mauli Agrawal

UT San Antonio has worked hard to establish competitive pay scales and new faculty start up packages to attract and retain the highly talented faculty to the campus. Commercial research is also promoted as a means to increase lab funding and invigorate translational work to move research from discovery to application. UT San Antonio's license royalty sharing policy encourages faculty and staff to pursue inventions and commercialization, and in return share in the royalties generated by their innovations. Coupled with a regional entrepreneurial ecosystem, the university has established policies, processes, and facilities, networked in the community, to help innovative faculty see their ideas through to commercialization. These combined incentives will continue to draw faculty to UT San Antonio, and with growing success in these STEMM areas, will elevate the research and commercialization successes and reputation of the university. As an example, The UT System's Chancellor's Entrepreneurship and Innovation Awards recognized Dr. Mauli Agrawal for his discoveries in tissue engineering and orthopedic implants. Dr. Agrawal's inventions have enabled three spin-out companies: Osteobiologics, VidaCare, and Xilas Medical, Inc.

The University of Texas at Tyler

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $57 million to strengthen competitiveness at UT Tyler. The initial impact of these investments is presented here, organized according to the critical elements described by RAGS: education, research and technology development, and competitive capacity.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT Tyler at a Glance

Student enrollment in STEMM, 2008	
Undergraduate (STEMM % of total)	828 (16%)
Graduate (STEMM % of total)	92 (12%)
New faculty recruited (2005-2008)	
STARs faculty recruited	2
ETF research superiority award recipients	1
Physical space (square footage)	
Teaching	211,000
Research	10,500
Increase in total sq. ft. through initiative	12%
New STEMM-related endowments (2005-2008)	$440,000
Research expenditures, 2008	$3.4 million
Federal research expenditures, 2008	$1.8 million
New invention disclosures, 2005-2008	4

Education

Under the UT System Competitiveness Initiative, UT Tyler increased its academic physical space by 19,700 square feet (9%). Increases in classroom and research space have opened the door to new degree programs in STEMM fields. The three new programs are in civil and environmental engineering and nursing. These expanded opportunities have allowed UTT to focus on increasing student success with the implementation of several initiatives. For example, supplemental instruction, a new advising center, and the creation of learning communities target improving student retention. More than 67 percent of freshmen have been exposed to one or more student success programs.

UT Tyler is focused on increasing educational opportunities in science, technology, engineering, math, and medical/health fields to overcome the workforce shortfall predicted in the RAGS report. Approximately 16 percent

of all undergraduate students enrolled at UTT major in STEMM fields. Undergraduate enrollment in STEMM has increased by 12 percent at UTT since 2005, while overall undergraduate enrollment has increased by 8 percent. This growth trend in STEMM enrollment is greater than the 5 percent growth in undergraduate STEMM enrollment at all UT System academic institutions. Undergraduate enrollment in nursing varied from year to year and in 2008 was only four students less than 2005 levels. This growth trend is less than the 9 percent increase in undergraduate nursing student enrollment at all UT System academic institutions. Undergraduate enrollment in health professions increased from two students per year to an enrollment of eight students in 2008.

Graduate enrollment in STEMM fields has increased almost 23 percent since 2005, adding 17 additional students. This growth is larger than the overall decline in graduate enrollment of 4 percent at UTT. The rate of increase at UTT is considerably larger than the 9 percent increase of STEMM graduate students enrolled at all UT System academic institutions while graduate enrollment for all majors increased by 4 percent. Graduate student enrollment in nursing increased slightly between 2005 and 2006 and has remained relatively stable. In contrast, nursing graduate student enrollment grew 12 percent at all UT System academic institutions.

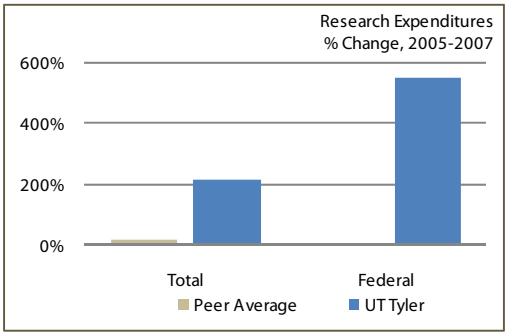
Undergraduate enrollment in STEMM at UTT has increased 10% since 2005. It has increased 23% at the graduate level.

An important initiative at UT Tyler is the East Texas Center for Science, Technology, Engineering, and Mathematics. The East Texas STEM Center received a $1.2 million federal grant to improve instruction and academic performance in science- and math-related subjects in rural school districts. Through research, technical assistance, professional development opportunities and access to curriculum, the program is working to meet the growing demand for graduates in the STEMM fields. This is critical to the U.S. remaining globally competitive in technology.

Research & Technology Development

UT Tyler's culture is changing with an enhanced focus on research. Implementing that change has included a newly creation position of Associate Vice President for Research. At UTT, this person is responsible for research administration, technology transfer, and federal relations. The development of this position demonstrates a strong commitment from UTT leadership to advance the research enterprise at UTT.

An ongoing initiative at UT Tyler is to increase the number of grant proposals submitted to support research activities. Through one-on-one faculty mentoring, training workshops, and expanded sponsored research staff, significantly more faculty are submitting grant proposals. These proposals will lead to new discoveries that drive education and expose students to state-of-the-art projects.



Source: NSF, NIH.

These investments to enhance the organizational research culture expand resources for faculty research projects, often tracked by the money spent to conduct the scientific investigations. Research expenditures at UT Tyler surpassed $1 million in 2007, increasing 217 percent between 2005 and 2007, while peers averaged a 16 percent increase. Research expenditures from federal sources also increased substantially, 551 percent during the same time period while peers averaged a 4 percent decrease.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is fundamental for institutional advancement. Resources include: world-class faculty, innovative buildings with advanced research laboratories and academic spaces, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. UT Tyler has increased the number of tenured/tenure track faculty by 8 percent, or 13 people, since 2005. Two faculty members were recruited through the STARs (Science and Technology Acquisition and Recruitment) Program.

In addition, one faculty member was recruited through a Texas Emerging Technology Fund Research Superiority Award for $3.75 million. Dr. Jan Sundell, research professor of engineering and a leading international expert on indoor air quality, came to UT Tyler to establish and direct The Texas Allergy, Indoor Environment and Energy Institute (TxAIRE). TxAIRE is based on a partnership with UT Dallas, the International Center for Indoor Environment and Energy at the Technical University of Denmark, and industry. UT Tyler and the UT System has committed $2.5 million to support TxAIRE over four years.

Dr. Jan Sundell

STARs Faculty

Dr. David Hoe, assistant professor of electrical engineering, was recruited from UT Arlington. Dr. Hoe's expertise is in integrated circuit design and mixed-signal system design. Prior to joining UT Tyler, Dr. Hoe worked for five years designing microelectronic circuits at the General Electric Research and Development Center and had ten years of academic experience.

Dr. Hector Ochoa, assistant professor of engineering, was Visiting Assistant Professor and was recruited to stay at UT Tyler. Dr. Ochoa, a graduate of UT El Paso, is an expert in radar signal analysis, including Doppler analysis of high-velocity radar targets. Dr. Ochoa's doctoral research was supported by the Army Research Laboratories.

Infrastructure

New construction and renovation of state-of-the-art buildings create educational and research possibilities that drive the competitiveness initiative. UT Tyler increased research space by 7,600 square feet (269%) since 2005. In addition, the Competitiveness Initiative funded two new facilities: the Renovation and Expansion for Engineering and Sciences and the Expansion of the Palestine Campus.

Competitiveness Initiative Supports $56 million for Capital Projects at UT Tyler

The Renovation and Expansion for Engineering Sciences project will cost $48 million and includes several phases to add 6,800 square feet of new space and renovate 250,500 of existing space. First, the Engineering, Science, and Technology north building will be renovated, converting existing science and math classrooms and laboratories into larger science laboratories appropriate for lower division students and adding faculty and staff space. Second, as scientists move into the new space, their offices will house major portions of the College of Education. Third, space vacated by the College of Education will return the student center back to students. Finally, surge space that is created by the renovation will become permanent study space for waiting art students.

The Expansion of the Palestine Campus will add 17,500 square feet of space to accommodate rapid enrollment growth. The $8 million project will add clinical and general classrooms, laboratories, and general faculty office space. The additional space provides needed expansion for programs such as nursing where critical shortages exist throughout the state.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UT Tyler raised more than $440,000 in STEMM-specific endowments since FY 2005, including graduate fellowships, distinguished chairs to support student scholarships and faculty research. Over $12,500 is distributed for STEMM research and scholarships on an annual basis from these new endowments. STEMM-related allocations equal 10 percent of the total philanthropic distribution per year. In addition, UT Tyler raised over $1.6 million in gifts to support the two construction projects for the UT Competitiveness Initiative.

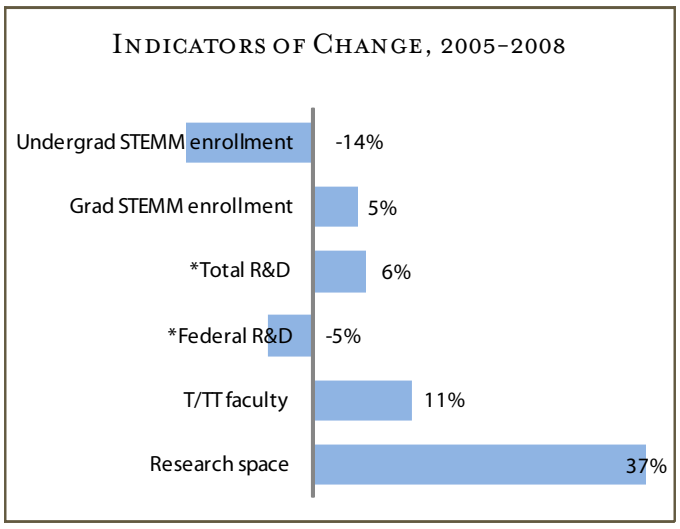
Faculty Awards

The faculty at UT Tyler are often recognized for their significant contributions to their areas of expertise and respective fields of study. The institution's competitive stature is enhanced by the recognition that these awards bring and the experiences that are then shared with students.

Dr. K. Lynn Wieck, Jacqueline M. Braithwaite Professor for the College of Nursing and Health Sciences, was named a fellow in the American Academy of Nursing. FAAN membership recognizes the outstanding accomplishments within the nursing profession and to health care. Dr. Wieck is most recently recognized for her research to improve retention among nurses and generational differences in expectations.

The University of Texas
Southwestern Medical Center at Dallas

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $205 million to strengthen competitiveness at UT Southwestern Medical Center. The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT Southwestern at a Glance

Student enrollment in STEMM, 2008	
Undergraduate	90
Post-baccalaureate	72
Graduate	2,253
STARs faculty recruited (2005-2008)	4
Physical space (square footage)	
Teaching	126,000
Research	854,600
Clinical	118,000
Increase in total sq. ft. through initiative	24%
New STEMM-related endowments (2005-2008)	$27 million
Research expenditures, 2008	$371 million
Federal research expenditures, 2008	$201 million
Intellectual property revenue, 2005-2008	$41 million
U.S. patents issued, 2005-2008	78
Licenses/options executed, 2005-2008	157
Start-up companies, 2005-2008	5

Education

UT Southwestern Medical Center has established four new degree programs: a Bachelor of Science in Radiation Therapy, a Master of Prosthetics and Orthotics, a Master of Clinical Nutrition, and a Doctor of Physical Therapy.

Undergraduate enrollment has decreased by 14 percent, or 15 students, at UT Southwestern since 2005. This growth trend is significantly less than the 14 percent growth in undergraduate enrollment at all UT System health institutions. Enrollment in post-baccalaureate programs also decreased by 23 percent, or 21 students.

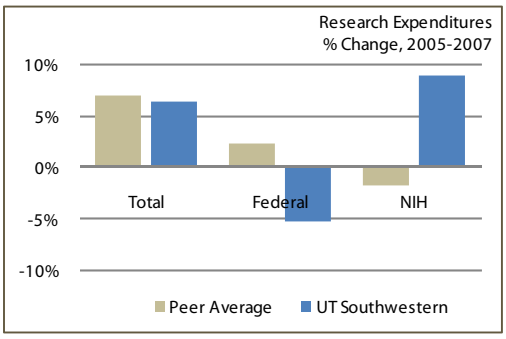
Graduate enrollment has increased 5 percent since 2005, adding 101 students. The rate of increase at UT Southwestern is slightly more than the 4 percent increase of graduate students enrolled at all UT System health institutions, which, in turn, is less than the national enrollment growth rate of 6 percent. Looking more in-depth gives a varied picture of enrollment across different levels of graduate students. Since 2005, enrollment in Master's programs increased 10 percent, enrollment in doctoral programs has increased one percent, and enrollment in professional programs (i.e., medical) increased 3 percent.

Research & Technology Development

UT Southwestern Medical Center has set as a top priority the advancement of the university's position as a leading institution of biomedical research. To help reach this goal, the institution is committed to providing necessary campus infrastructure to allow for continued, steady growth in research and clinical missions consistent with past growth.

A major institutional initiative to spur innovation in patient care and aid economic growth in the North Texas region is a new biotech park, called the BioCenter at UT Southwestern Medical District. The BioCenter is being built on 15.5 acres purchased from the city of Dallas for biomedical commercialization. BioCenter is designed to serve the entire spectrum of companies in the biotechnology and biodevice industry with its state-of-the-art facilities. It is the hub for commercial life-science in the North Texas region, an ideal home for biomedical research, product development, marketing, sales, and small-scale manufacturing—any enterprise seeking to merge scientific discovery with real-world application. The first 100,000 of 500,000 square feet of space will open in August 2009 with three similar buildings to follow. A Biomedical Acceleration/Incubator will initially occupy 8,000 square feet in the BioCenter's first building providing facilities for biomedical start-up companies to accelerate their development.

Investments in research and commercialization infrastructure have resulted in major advances in research competitiveness indicators, often tracked by the money spent to conduct scientific investigations. Research expenditures at UT Southwestern have increased at about the same rate as peer institutions, totaling 6 percent between 2005 and 2007, while peers averaged a 7 percent increase. Research expenditures from federal sources decreased 5 percent during the same time period while peers averaged a 2 percent increase. In particular, research expenditures from grants awarded by the National Institutes of Health (NIH) comprise 97 percent of federal research expenditures and have increased 9 percent while peer institutions averaged a 2 percent decrease.



Source: NSF, NIH.

UT Southwestern Medical Center received a five-year, $34 million Clinical and Translational Science Award (CTSA) from the NIH in 2007. The resulting North and Central Texas Clinical and Translational Science Initiative will include schools of allopathic and osteopathic medicine, dentistry, nursing pharmacy, public health, engineering and computer science, which had previously formed relationships supported by a NIH Roadmap award. A new department of clinical sciences, supported by faculty from all participating schools, serves as the academic home for the CTSA. Existing infrastructure and support include: a substantial financial commitment of participating institutions to the initiative; more than 200 established clinical and translational investigators who will act as faculty and mentors; and a large and medically diverse patient base cared for by established hospitals.

One impressive example of research conducted at UT Southwestern Medical Center is the identification of the most important cholesterol lowering target discovered in 20 years. Drs. Jonathan Cohen and Helen Hobbs discovered an extremely exciting novel target for cholesterol lowering drugs, nominally 'PCSK9.' In extensive genetic analysis of a population within the Metroplex area, these investigators found that mutations in the PCSK9 protein can result in marked reductions in plasma levels of cholesterol. It is expected that this will result in an entirely new class of cholesterol lowering drugs, and is already the subject of drug discovery efforts by some of the leading pharmaceutical companies in the U.S.

Major breakthroughs in cholesterol have a long history at UT Southwestern Medical Center. Drs. Michael Brown and Joseph Goldstein discovered the basic mechanism of cholesterol metabolism and won the 1985 Nobel Prize. Their research led to the development of today's cholesterol-lowering drugs that save millions of lives.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include innovative buildings with advanced research laboratories and academic spaces, world-class faculty, recognition programs to support faculty efforts, and interest from external donors. These four areas of competitive capacity are inseparable; quality, cutting-edge research requires specially-designed laboratories outfitted with advanced equipment. These labs attract world-class researchers that translate the research findings to students, the public, and into devices that affect everyday lives. The investments in competitive capacity as a result of the UT System Competitiveness Initiative are outlined below.

Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. The number of tenured/tenure track faculty has increased by 11 percent at UT Southwestern Medical Center since 2005, adding 42 additional faculty members. Five world-renowned faculty members were recruited through the STARs (Science and Technology Acquisition and Recruitment) program.

STARs Faculty

Dr. Joel Elmquist is Maclin Family Professor in Medical Science, in Honor of Dr. Roy A. Brinkley and professor of internal medicine and Center for Hypothalamic Research. Dr. Elmquist is an expert in neuroscience, specifically focused on defining central pathways that regulate body weight and food intake and how abnormalities of these pathways contribute to obesity, insulin resistance, and type II diabetes. Dr. Elmquist's recruitment package included $1 million from STARs, $1.5 million from the institution, and $1 million for an endowed chair. Dr. Elmquist was recruited from Harvard Medical School where he was associate professor of neurology and medicine.

Dr. Philipp Scherer is Gifford O. Touchstone Jr. and Randolph G. Touchstone Distinguished Chair in Diabetes Research, professor of internal medicine, and director of the Touchstone Diabetes Center. Dr. Scherer is an expert in the mechanisms involved in the development of type II diabetes and is dedicated to developing novel therapeutic approaches to improve insulin sensitivity. Dr. Scherer was recruited from the Albert Einstein College of Medicine, receiving $1.5 million from STARs, $7 million from the institution for lab start-up costs, and $7 million in endowment to recruit Dr. Scherer and his lab staff.

Dr. Joan Schiller is the Andrea L. Simmons Distinguished Chair in Cancer Research and professor, chief of the hematology/oncology division of the department of internal medicine, and deputy director of the Simmons Cancer Center. Dr. Schiller is an internationally recognized expert in drug development for lung cancer and has been active in Phase I, II and III clinical trials. Dr. Schiller was recruited from the University of Wisconsin where she held the Melanie Heald Endowed Professorship. STARs funds totaled $2 million to support Dr. Schiller's research program.

Dr. Joe Takahashi, professor and chair of neuroscience, was recruited from Northwestern University as an internationally renowned expert in circadian rhythms in mammals. In 1997, Dr. Takahashi led the team that cloned "Clock," the first mammalian circadian gene to be cloned. Dr. Takahashi received $4 million over two years in STARs funding.

Dr. Xiadong Wang is George L. MacGregor Distinguished Chair in Biomedical Science, professor in the department of biochemistry, and Howard Hughes Medical Institute Investigator. Dr. Wang's expertise is in the biochemical pathway through which human cells complete their developmental process, which could eventually lead to new treatments for cancer, neurological disorders, and other diseases. The $1.5 million from STARs was matched by a $2 million endowed professorship to prevent Dr. Wang from leaving UT Southwestern Medical Center for a position as director for the National Institute for Biological Sciences in China.

Infrastructure

New construction and renovation of state-of-the-art buildings create educational and research possibilities that drive the competitiveness initiative. UT Southwestern Medical Center increased research space by 37 percent since 2005, adding over 230,000 square feet. In addition, the Competitiveness Initiative funded two new facilities that add over 350,000 square feet of space: the Laboratory Research and Support Building and the Phase 5 construction of the North Campus.

Competitiveness Initiative Provides $193 million for Capital Projects at UT Southwestern

The Laboratory Research and Support Building will contain two floors for a pathogen-free vivarium facility to include areas for: animal holding, procedures, laboratories, cage-washing and autoclave, and associated material handling and storage. The remaining two floors will be used for research and support. The $36.6 million project is complete and added 80,000 square feet of space, 16,000 of which was left as shell space on the fourth floor.

North Campus Phase V will add a twelve story biomedical research building, a vehicular bridge to the main North Campus entry, a pedestrian bridge connecting to the Pickens Biomedical Building, and an expansion of the North Campus Thermal Energy Plant. Four floors will be finished –out initially, including a 3,000 square foot structurally isolated microscopy laboratory. The remaining floors will be finished-out in a subsequent project. The $156 million project is about one-third complete and is expected to be fully complete in spring 2010.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UT Southwestern raised almost $27 million in STEMM-specific endowments since FY 2005, including graduate fellowships, distinguished chairs to support faculty research, and student scholarships. Almost $770,000 is distributed for STEMM research and scholarships on an annual basis from these new endowments. In addition, UT Southwestern raised $43 million in gifts to support the Phase V construction of the North Campus, one of the construction projects for the UT System Competitiveness Initiative.

Faculty Awards

The faculty at UT Southwestern are often recognized for their significant contributions to their areas of expertise and respective fields of study. The institution's competitive stature is enhanced by the recognition that these awards bring and the experiences that are then shared with students. For example, since 2005 five faculty were invited into the National Academy of Sciences, three were invited into the American Academy of Arts and Sciences, and two were named Fulbright American Scholars.

Twenty faculty at UT Southwestern have MERIT (Method to Extend Research in Time) Awards from the National Institutes of Health (NIH), a true symbol of scientific achievement in the research community. MERIT awards are rare, offered to less than 5 percent of NIH-funded investigators, limited to those who have demonstrated superior competence and outstanding productivity in previous research efforts. MERIT awards provide investigators with long-term, stable research funding to foster their continued creativity without the burden of preparing frequent research grant proposals. MERIT Award recipients at UT Southwestern equal almost half of all MERIT Award recipients in the entire UT System.

Incentives

Various Systemwide initiatives and institutional programs provide additional incentives to excel in science, technology, engineering, math, and health.

The UT System Texas Ignition Fund (TIF) is a seed-grant program to further develop inventions that need additional work to attract angel or venture capital investors and advance the invention's path toward the marketplace. The TIF has funded projects to commercialize 5 inventions at UT Southwestern.

- An integrated patient bed system, or "smart bed," that enables self-contained, fully portable necessary services and therapeutic protocols to be digitally administered according to physician instructions. Wireless communications and data management allow remote/virtual control and operation.
- Xanapath, a start-up company that was formed around an UT Southwestern Medical Center invention. Researchers developed a microscope based on hyper-spectral imaging that enables simultaneous testing for many cancer types, including breast, lung, and colon. It can lead to better diagnosis by testing multiple pathologies at once.

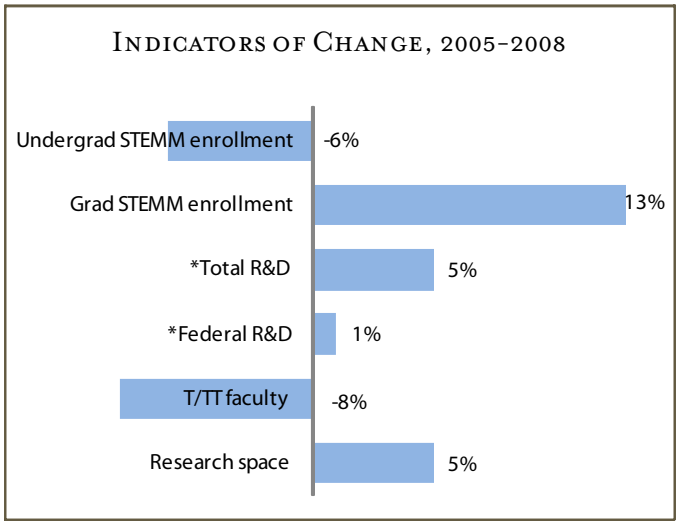
- A treatment for solid cancerous tumors that has less severe side-effects and is more effective than existing drugs. The drug treatment is particularly useful for cancers that are resistant to radiation and chemotherapy.
- A wireless sensor to aid in the diagnosis of gastroesophageal reflux disease that operates without batteries (collaboration with UT Arlington).
- StoneMag System (collaboration with UT Dallas) is expected to enable, for the first time, a surgeon to effectively and rapidly retrieve all stone fragments from a kidney, significantly reducing operation time, treatment costs and the morbidity of stone recurrences.

Dr. Charles Pak, the Alfred L. and Muriel B. Rabiner Distinguished Academic Chair for Mineral Metabolism Biotechnology Research and professor of internal medicine, was recognized by The UT System's Chancellor's Entrepreneurship and Innovation Awards for his discoveries in the management of renal stones and management of osteoporosis. Dr. Pak has developed three FDA approved orphan drugs for kidney stones, uncovered metabolic causes for kidney stone formation, and devised a multi-test kit for individuals at risk for forming kidney stones. Dr. Pak led the development of Citracal for the prevention of osteoporosis and Urocit-K for the control of kidney stones. His research has led to more than 15 U.S. issued patents.

The University of Texas Medical Branch at Galveston

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $241.5 million to strengthen competitiveness at UT Medical Branch. The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.

On September 13, 2008, Galveston Island suffered a direct and devastating hit from Hurricane Ike, the third most destructive hurricane to make landfall in the United States. Ike's storm surge flooded more than 1 million square feet of first-floor clinical, research and education space on the UTMB campus, with flood levels ranging from a few inches in the university library to approximately eight feet in historic Old Red. Imaging equipment, linear accelerators, patient simulation equipment and other critical resources were also lost. In all, damages—including estimated business losses—amounted to approximately $1 billion. As a result, many services provided by the institution had to be scaled back to protect and preserve UTMB's core missions and safeguard its future, resulting in a reduction in force affecting more than 2,000 employees. If Hurricane Ike has a silver lining, for UTMB it is the reawakened and expanded appreciation of UTMB's many vital contributions to the health and well-being of its home community, the region, the state as a whole and beyond. Coupled with the invaluable support of countless elected officials, the UT System, the local community, multiple philanthropic organizations and individuals, numerous alumni and friends, and dedicated faculty, staff and students, UTMB is well on the road to recovery, with every promise of being an even stronger institution in the years ahead.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT Medical Branch at a Glance

Student enrollment in STEMM, 2008	
Undergraduate	504
Graduate	1,834
STARs faculty recruited (2005-2008)	4
Physical space (square footage)	
Teaching	162,000
Research	477,000
Clinical	182,000
Increase in total sq. ft. through initiative	20%
New STEMM-related endowments (2005-2008)	$65 million
Research expenditures, 2008	$154 million
Federal research expenditures, 2008	$122 million
Intellectual property revenue, 2005-2008	$6 million
U.S. patents issued, 2005-2008	43
Licenses/options executed, 2005-2008	72
Start-up companies, 2005-2008	6

Education

Under the UT System Competitiveness Initiative, UT Medical Branch increased its academic physical space by over 12,000 square feet, or 8 percent. Increases in classroom space allowed for the creation of five new degree programs in clinical laboratory services, clinical science (MS and PhD), physical therapy, and rehabilitation sciences. In 2008, UT Medical Branch established as an institutional priority achieving national prominence for innovative and effective educational curricula focused on evidence-based learning and practice across the health professions.

Undergraduate enrollment in STEMM has decreased by 6 percent at UT Medical Branch since 2005. This decline in STEMM enrollment is significantly less than the 14 percent growth in undergraduate STEMM enrollment at all UT System health institutions. The overall decline is due to a drop in enrollment in nursing programs, which decreased 17 percent, or a loss of 62 students. However, student enrollment in health professions increased by 33 students or 26 percent, and is higher than the growth trend for all UT System health institutions. Post-

baccalaureate enrollment decreased by 14 students, or 29 percent; however, enrollment in the biomedical sciences programs increased by 4 students, or 19 percent.

Graduate enrollment in STEMM fields has increased 13 percent since 2005, adding an additional 209 students. The rate of increase at UT Medical Branch is considerably higher than the 4 percent increase of STEMM graduate students enrolled at all UT System health institutions and more than the national enrollment growth rate of 6 percent. Specifically, enrollment has increased in Master's degree programs in health professions (21%) and nursing (28%), yet has decreased for the Master's degree program in biomedical sciences (37%). Enrollment is fairly steady across doctoral programs in biomedical sciences and nursing and overall doctoral enrollment has increased with the addition of a doctoral program in health professions. Medical student enrollment has increased 9 percent, adding 73 students.

Research & Technology Development

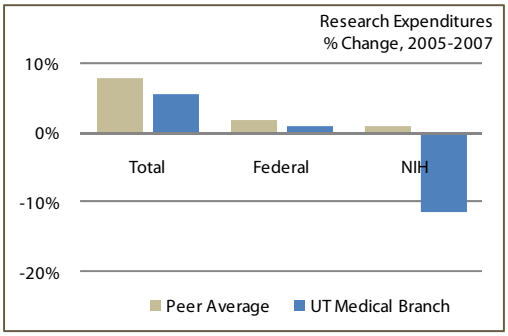
UT Medical Branch has shown a firm commitment to becoming known nationally and globally as a leader in health care delivery and biomedical sciences. The institution plans to achieve this goal by developing or expanding priority clinical and research programs and facilities. One remarkable investment and accomplishment to this end is the establishment of the Galveston National Laboratory (GNL), one of two National Biocontainment Laboratories in the U.S. The GNL provides research space and specialized capabilities to develop therapies, vaccines, and diagnostic tests for naturally occurring emerging diseases as well as those employed by terrorists. While the GNL is owned and operated by UT Medical Branch, the lab is available to provide assistance to national, state, and local public health efforts during a biological attack, all within a safe and secure research environment. In addition to the GNL, UT Medical Branch is also home to the first full-size Biosafety Level 4 laboratory located on a university campus in the U.S.

Galveston National Laboratory at UTMB is a secure research environment that assists with public health efforts during a biological attack.

UTMB recently received the highest score given by the NIH in this round of applications for the Clinical and Translational Science Award (CTSA). At press time for this publication, UTMB had not received final word yet on the awarding of the grant but feel confident—based on the grant score and the site visit by NIH—that UTMB will receive the CTSA five-year, $42 million grant. The CTSA seeks to facilitate translational research as a rigorous discipline, develop translational research training programs at all levels in the graduate continuum, effectively conduct and bridge step one translational research to steps two and three, and interface productively with the national CTSA consortium. To accomplish these goals, UTMB organized its Institute for Translational Sciences (ITS) into 12 key resources—combinations of university core laboratories and intellectual resources, integrated by a single point of investigator/trainee contact. This structure will make ITS more rapidly responsive to the needs of investigators and trainees.

Another example of the innovation taking place at UT Medical Branch is InPlace Medical Solutions, an offshore medical service that connects remote workers to physicians using telemedicine capabilities in places such as oil rigs, correctional facilities, and other remote locations. The live, two-way video-conference offers up to 85 percent of the medical services provided by a "brick and mortar" doctor's office. The product was licensed and developed by NuPhysicia LLC, a UT Medical Branch start-up company that was established in 2007.

These investments in excellence contribute to enhanced resources for faculty research projects, often tracked by the money spent to conduct the scientific investigations. Research expenditures at UT Medical Branch have increased 5 percent between 2005 and 2007, while peers averaged an 8 percent increase. Research expenditures from federal sources increased one percent during the same time period while peers



Source: NSF, NIH.

averaged a 2 percent increase. Research expenditures from grants awarded by the National Institutes of Health (NIH) were substantially different between UT Medical Branch and its peers: UT Medical Branch decreased by 12 percent and peers reported a one percent increase. The CTSA award described above is expected to catalyze research funding across the institution over the long term.

Competitive Capacity

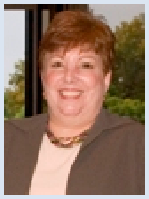
Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include innovative buildings with advanced research laboratories and academic spaces, world-class faculty, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. UT Medical Branch's number of tenured/tenure track faculty decreased by 8 percent, or 41 people, between 2005 and 2008. However, the research expenditures per tenured/tenure-track faculty member grew 11 percent during this time. It is important to note that the financial impact of Hurricane Ike led to faculty layoffs at the institution in FY 2009 and will impact future trends at the institution.

The STARs (Science and Technology Acquisition and Recruitment) Program enabled UT Medical Branch to add four faculty members and retain one professor, increasing the collection of talent at the institution.

STARs Faculty



Dr. Miriam Alter is the Robert E. Shope Professor in infectious diseases epidemiology and director of the Infectious Disease Epidemiology Program. Dr. Alter is a professor in the departments of internal medicine and preventive medicine and community health. Dr. Alter is internationally recognized for her work in epidemiology of the transmission patterns of Hepatitis viruses and influenza which can be found in more than 200 publications. The recruitment package included $1.25 million from STARs and $300,000 from UT Medical Branch, which established molecular epidemiology core laboratory and the first "wet-lab" in the UT Medical Branch School of Nursing. Dr. Alter was recruited from the Centers for Disease Control and Prevention.

Dr. George Jackson is John Sealy Chair for Parkinson's Disease Research, director of the George P. and Cynthia Woods Mitchell Center for Neurogenerative Diseases and professor of neurology, neuroscience and cell biology, and biochemistry and molecular biology. Dr. Jackson is an expert in neurogenerative diseases such as Huntington's disease, Parkinson's disease, and ALS. A STARs award of $700,000 was used to recruit Dr. Jackson from UCLA.

Dr. James LeDuc is the Robert E. Shope, M.D., and John S. Dunn Distinguished Chair in Global Health, director of the program in public health, professor of microbiology and immunology, and deputy director of Galveston National Laboratory. Dr. LeDuc has over 200 publications and was recruited to fill a critical new role within the Institute for Human Infections and Immunity—that of the first Director of the Global Health Program. His recruitment from the Center for Disease Control and Prevention was successful with $1.5 million from STARs, $400,000 from endowment funds, and support from a recent $54 million award for operation within the Galveston National Laboratory.

Dr. Csaba Szabo, visiting professor of anesthesiology, was recruited from the University of Medicine and Dentistry in New Jersey. Dr. Szabo is a physiologist and pharmacologist who has developed a unique translational approach to human disease and is described as the driving force behind a paradigm shift in the management of critical illness. Dr. Szabo received $1.1 million from the STARs program and $250,000 plus 1,200 square feet of laboratory space from UT Medical Branch.

Dr. David Walker is the Carmage and Martha Walls Distinguished Chair in Tropical Diseases and professor and chair of pathology, was retained to implement a campus-wide program in Endothelial Pathobiology with emphasis on acute injury. Dr. Walker has been a driving force in UTMB's world-renowned infectious disease program and has been responsible for attracting more than $200 million in biodefense research and construction awards from NIH in recent years. The $2.5 million STARs award was matched by the UT Medical Branch.

Infrastructure

New construction and renovation of state-of-the-art buildings create educational and research possibilities that drive the competitiveness initiative. Funds from the Competitiveness Initiative have been used for the Galveston National Laboratory ($174 million, including almost $117 in external grants and $57 million in tuition revenue bonds) and the Specialty Care Center at Victory Lake ($61 million, including $10 million in institutional funds). Construction of a new surgical tower, the Jennie Sealy Replacement Hospital, had been put on hold. However, UTMB recently received authorization to issue $150 million in tuition revenue bonds and received a $125 million commitment from the Sealy & Smith Foundation for the construction of the new surgical tower as well as the repair and modernization of the existing hospital complex. The Basic Science Renovation is currently in the design phase.

Competitiveness Initiative Provides $235 million for Capital Projects at UTMB

The Galveston National Laboratory (GNL) is a186,000 square foot research facility. The Laboratory is an essential component of a national initiative to enhance biodefense research capabilities in order to promote the development of effective vaccines, diagnostics, and therapeutics capable of mitigating the threat of dangerous emerging infectious diseases. The $174 million initiative builds on UT Medical Branch's strengths and establishes the institution as the world's premier site for infectious disease research while supporting national objectives. Construction of the GNL was completed in August 2008. When Hurricane Ike struck Galveston Island in September, the GNL withstood the storm and suffered no damage—precisely as designed. The lab's dedication moved forward in November, a mere two months after the hurricane made landfall.

The Specialty Care Center at Victory Lakes will provide 110,000 square feet of space for outpatient services when it opens in early 2010. The $61 million project will serve one of the fastest growing areas in the state of Texas and will address the short stay and ambulatory care needs of UT Medical Branch employees and families as well as residents of the region.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UT Medical Branch raised $65.3 million in STEMM-specific endowments since FY 2005, including graduate fellowships, distinguished chairs to support faculty research, and student scholarships. Almost $2 million is distributed for STEMM research and scholarships on an annual basis from these new endowments.

Faculty Awards

The faculty at UT Medical Branch are often recognized for their significant contributions to their areas of expertise and respective fields of study. For example, two professors are members of the prestigious Institute of Medicine, two professors were named fellows of the American Academy of Nursing, two were inducted into the American Academy of Arts and Sciences, and two received Fulbright American Scholars awards.

Four faculty hold NIH MERIT (Method to Extend Research in Time) Awards, a true symbol of scientific achievement in the research community. MERIT awards are rare, offered to less than 5 percent of NIH-funded investigators, limited to those who have demonstrated superior competence and outstanding productivity in previous research efforts. MERIT awards provide investigators with long-term, stable research funding to foster their continued creativity without the burden of preparing frequent research grant proposals. UTMB's past NIH MERIT award recipients include scientists with expertise in gastrointestinal physiology and the molecular mechanisms of normal intestinal and cancer growth; drug metabolism and molecular toxicology; the role cell death plays in various immune-mediated diseases, especially HIV; DNA repair processes; and the influence of proteins on diabetic complications and therapeutic strategies to suppress such complications.

Members of the National Academies of Science

Dr. Howard Brody is director of the Institute for the Medical Humanities, John P. McGovern Centennial Chair, and professor of family medicine. Dr. Brody is internationally recognized for his work in medical ethics, family medicine, and philosophy of medicine and his work has been translated into six languages. Dr. Brody has been inducted into the Institute of Medicine and the National Academy of Sciences.

Dr. Frederick Murphy is professor of pathology and McLaughlin Professor in Residence. Dr. Murphy is a pioneering virologist and is credited as one of the scientists who first identified the Ebola and Marburg viruses, among others. Dr. Murphy was elected to the Institute of Medicine among many other prestigious honors.

Incentives

Listed below are examples of two system-wide initiatives that provide additional incentives to excel in science, technology, mathematics, and health.

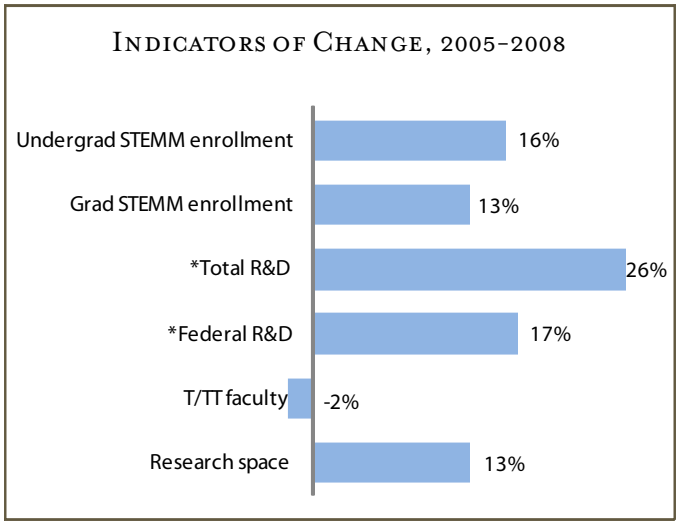
The Chancellor's Entrepreneurship and Innovation Awards recognized Dr. Darrell Carney, professor of biochemistry and molecular biology, for his research to understand the molecular regulation of inflammation and wound healing. Dr. Carney is co-founder and scientific director of the biopharmaceutical start-up company, Chrysalis BioTechnology, Inc. The company's lead product, Chrysalin®, is used for bone fracture healing and wound healing of chronic diabetic ulcers. Chrysalis was acquired by OrthoLogic Corp. in 2004.

The UT System Texas Ignition Fund (TIF) has awarded projects to commercialize four inventions at UT Medical Branch:

- A small, lightweight and low cost IV pump that precisely monitors and controls the amount of fluid released to a patient to ensure that errors in over-resuscitation do not occur
- A pulmonary drug delivery system that converts dry powder into an aerosol form
- A novel device for performing tissue sutures in the colon, known as a needle-electrode anchor system
- A device to deliver a nerve block with an electrode rather than an incision

The University of Texas Health Science Center at Houston

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $244 million to strengthen competitiveness at UT HSC-Houston. The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.



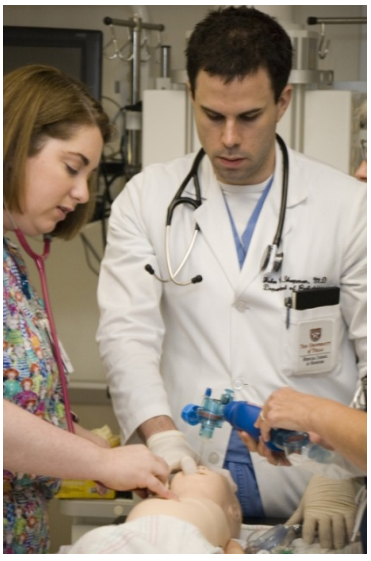
STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT HSC-Houston at a Glance

Student enrollment in STEMM, 2008	
Undergraduate	468
Post-baccalaureate	309
Graduate	3,088
STARs faculty recruited (2005-2008)	3
ETF research superiority award recipients	1
Physical space (square footage)	
Teaching	216,000
Research	402,700
Clinical	156,000
Increase in total sq. ft. through initiative	30%
New STEMM-related endowments (2005-2008)	$10.9 million
Research expenditures, 2008	$197 million
Federal research expenditures, 2008	$129 million
Intellectual property revenue, 2005-2008	$16.2 million
U.S. patents issued, 2005-2008	23
Licenses/options executed, 2005-2008	120
Start-up companies, 2005-2008	9

Education

Under the UT System Competitiveness Initiative, UT Health Science Center at Houston increased its academic physical space by 6,500 square feet. A major educational initiative has been to expand the School of Public Health by expanding physical space as well as programs offered. Many new degrees in public health are now established, with new academic tracks in biostatistics, environmental and occupational health, epidemiology, health promotion and behavioral sciences, healthcare management, and community health practice. These programs are offered at regional campuses in Houston, Austin, Brownsville, Dallas, El Paso, and San Antonio.



UT HSC-Houston offers two undergraduate degree programs in nursing and dental hygiene. Undergraduate enrollment has increased by 16 percent, or 65 students, at UTHSCH since 2005. This growth trend is due primarily to planned enrollment increases in the undergraduate nursing program and is slightly higher than the 14 percent growth in undergraduate enrollment at all UT System health institutions. Since 2007, new post-baccalaureate programs in biomedical sciences, health information sciences, medical academics, nursing, and public health have increased enrollment at UTHSCH. Over half (51%) of these post-baccalaureate students are enrolled in public health.

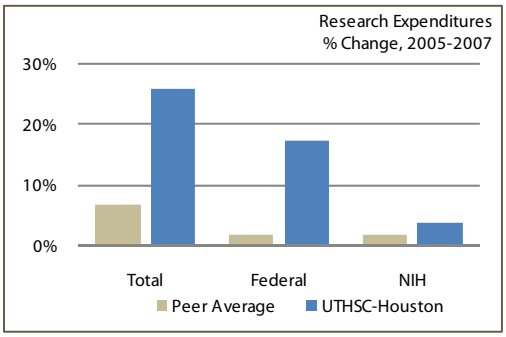
Graduate enrollment has decreased 3 percent since 2005, losing almost 100 students. The rate of increase at UT HSC-Houston is less than the 4 percent increase of graduate students enrolled at all UT System health institutions, which, in turn, is less than the national enrollment growth rate of 6 percent. Looking more in-depth gives a varied picture of enrollment across different levels of graduate students. Since 2005, enrollment in Master's programs has declined 24 percent, enrollment in doctoral programs has increased 10 percent, and enrollment in professional programs (e.g., dental school/academics, dental school, and medical) increased 13 percent.

Research & Technology Development

UT Health Science Center at Houston has made major investments in cross-cutting research space and moving basic research projects into products that can benefit the public. For example, the Pioneer Fund is a seed fund to support the translation of promising research discoveries through protection and commercialization of the intellectual property. In addition, UTHSCH has established an Entrepreneurs-in-Residence Program that supports external entrepreneurs in their pursuit of UTHSCH cutting-edge technologies. The residents conduct analyses of the technologies and make selections that lead to spin-outs of new commercial entities. The UTHSCH New Ventures Development Fund assists new spin-outs with early seed dollars critical in their formative stages.

If these commercial entities need physical space equipped with laboratories, high-tech equipment, and administrative offices, they may choose to occupy the Biotechnology Commercialization Center (BCC) for one to two years. The BCC contains about 30,000 square feet of space to support the successful development of new businesses. The facility includes chemistry and high throughput screening/imaging laboratories, an animal vivarium, and office/conference room space. In fact, the BCC will have a positive impact on economic development in the Southeast Texas Region because space also is available to start-up companies based on intellectual property that was not developed at UTHSCH.

Investments in researcher and entrepreneur resources have resulted in major advances in research competitiveness indicators, often tracked by the money spent to conduct scientific investigations. Research expenditures at UT Health Science Center at Houston have increased at a significantly faster rate than peer institutions, totaling 26 percent between 2005 and 2007, while peers averaged a 7 percent increase. Research expenditures from federal sources increased 17 percent during the same time period while peers averaged a 2 percent increase. In particular, research expenditures from grants awarded by the National Institutes of Health comprise two-thirds of federal research expenditures and have increased 4 percent while peer institutions averaged a 2 percent increase. In the next few years, the NIH award described below, as well as the receipt of other competitive NIH grants, will positively impact this trend.



Source: NSF, NIH.

UTHSC-H received one of the first Clinical and Translational Science Awards (CTSA) from the NIH in 2006. The resulting Center for Clinical and Translational Sciences (CCTS) at the Texas Medical Center in Houston will foster integration of clinical and translational research at UTHSC-H, UT M.D. Anderson Cancer Center, the UTHSC-H General Clinical Research Center at Brownsville and Memorial Hermann Healthcare System. The five-year, $36 million grant will ultimately enable researchers to provide new treatments more efficiently and quickly to patients. Other examples of UTHSC-H's leadership of grand-scale collaborations are their Gulf Coast Consortia/Keck Center for Interdisciplinary Biosciences Training, the Traumatic Brain Injury Consortium, and the Alliance for NanoHealth. Today there are four CTSAs in Texas that are united through the Texas CTSA Network initially organized by UTHSC-H. The Texas CTSA Network is an inter-institutional consortia recognized by the National Institutes of Health's National Center for Research Resources, the agency that administers the CTSAs.

One impressive example of research conducted at UT Health Science Center at Houston that has a major impact on human life is Dr. Myriam Fornage and Dr. Eric Boerwinkle's identification of a stroke gene. The international research team's discovery could lead to the development of new strategies to detect an increased risk of stroke prior to the onset of symptoms and to the creation of treatments intended to target the molecular mechanisms underlying stroke risk.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include innovative buildings with advanced research laboratories and academic spaces, world-class faculty, recognition programs to support faculty efforts, and interest from external donors. These four areas of competitive capacity are inseparable; quality, cutting-edge research requires specially-designed laboratories outfitted with advanced equipment. These labs attract world-class researchers that translate the research findings to students, the public, and into devices that affect everyday lives. The investments in competitive capacity as a result of the UT System Competitiveness Initiative are outlined below.

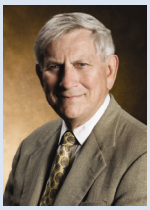
Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. The number of tenured/tenure track faculty has remained relatively stable at UT Health Science Center at Houston since 2005. Three world-renowned faculty members were recruited through the STARs (Science and Technology Acquisition and Recruitment) Program and two received Research Superiority Program awards from the Texas Emerging Technology Fund.

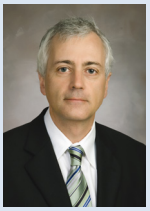
Infrastructure

UT Health Science Center at Houston increased research space by 13 percent since 2005, adding over 47,000 square feet. In addition, the Competitiveness Initiative funded three new facilities: the Biomedical Research and Education Facility, the Dental Branch Replacement Building, and the Expansion of the Regional Academic Health Center Public Health Satellite building located at UT Brownsville's campus.

STARs Faculty



Dr. C. Thomas Caskey, an internationally recognized geneticist, was recruited as Director, Chief Operating Officer and Chief Executive Officer-Elect of the Brown Foundation Institute of Molecular Medicine (IMM). Dr. Caskey now serves as the Director and CEO of IMM, executive vice president of molecular medicine and genetics, and the George & Cynthia Mitchell Distinguished Chair in the Neurosciences. STARs funding totaled $3 million, matched by institutional funds totaling $3 million.



Dr. John F. Hancock is Professor and Fondren Chair in Cellular Signaling in the Department of Integrative Biology and Pharmacology. Dr. Hancock was recruited from the University of Queensland to continue his breakthrough discoveries in underlying molecular switches important in carcinogenesis and metastatic phenomena. The STARs award for $1.5 million was matched by institutional funds totaling $2.5 million for equipment and $3.2 million over five years to replace funding previously received from the Australian Government.

Dr. Eva Sevick-Muraca, a pioneer in diagnostic imaging for nodal staging in cancer, is Professor and Cullen Chair in Molecular Medicine at UTHSCH's IMM where she currently directs the Center for Molecular Imaging. Dr. Sevick-Muraca also leads the National Cancer Institute Center for Translational Research. The $2 million STARs award will help her establish her lab at UTHSCH.

TETF Research Superiority Program

Dr. Mauro Ferrari, world class expert and pioneer in the field of nanomedicine, was recruited to lead the Alliance for NanoHealth through a Texas Emerging Technology Award for $2.5 million. The Alliance for NanoHealth is a consortium of eight institutions to develop multidisciplinary, nanotechnology-based solutions to unresolved problems in medicine. Dr. Ferrari serves as chair of the Department of Biomedical Engineering at the UTHSCH, professor of Experimental Therapeutics at the UT M. D. Anderson Cancer Center, professor of Bioengineering at Rice University, and professor of Biochemistry and Molecular Biology at UT Medical Branch. Dr. Ferrari also heads the 42-person NanoMedicine Research Center in the Department of Biomedical Engineering.

U.S. Army Surgeon Col. John Holcomb, MD was recruited to launch the Center for Translational Injury Research (CeTIR) and assume the title of professor and chief of acute care surgery. Dr. Holcomb's $13 million recruitment package was a collaborative partnership between UTHSCH, the Texas Emerging Technology Fund, the Memorial Hermann Healthcare System, and the University of Texas System Medical Foundation. The funds were used to establish the CeTIR and provide research funds to attract a world-class team of experts in medical research and trauma care. Dr. Holcomb also was appointed the Chancellor's Health Fellow for Trauma and Injury Programs. In this role, Dr. Holcomb will work with all 15 UT System institutions to strengthen research, educational, prevention, and treatment programs for trauma and injury.

Competitiveness Initiative Provides $236 million for Capital Projects at UTHSCH

The Biomedical Research and Education Facility (BREF) and the Dental Replacement Building are located in the UT Research Park being jointly developed by UTHSCH and UT M. D. Anderson Cancer Center. The BREF consists of 170,300 gross square feet that will contain both wet and dry labs, supporting research such as neurological imaging and adult stem cell studies. The $77 million project is 80% complete and expected to be completed in December 2009.

The Dental Replacement Building replaces a 52-year-old facility with 285,000 gross square feet of space for research labs, computerized simulators, instruction, learning resources, and patient services. The $155 million project is the largest single-project capital outlay for the UTHSCH. The building will be connected to the BREF via hallways where the oral pathology labs and the Houston Biomaterials Research Center will be housed. Construction has begun and is expected to be completed in summer of 2012.

The expansion of the RAHC Public Health Satellite building is located on the UT Brownsville campus. An additional 15,000 square feet has been added to the existing building and a Biosafety Level 3 laboratory will support the bioterrorism research initiative. The $4 million project was completed in 2008.

Philanthropy to Support STEMM Initiatives

UT Health Science Center at Houston raised almost $11 million in STEMM-specific endowments since FY 2005, including 22 professorships or distinguished chairs to support faculty research. Almost $300,000 is distributed for STEMM research and scholarships on an annual basis. STEMM-related allocations equal 99 percent of the total philanthropic distribution per year. An additional $2 million in donations were raised for the new construction of the dental replacement building.

Faculty Awards

The faculty at UT Health Science Center are often recognized for their significant contributions to their fields of study. For example, since 2005 the following five faculty members have been inducted to the Institute of Medicine:

- Dr. Lu Ann Aday, Lorne D. Bain Distinguished Professor Emerita in Public Health and Medicine
- Dr. Thomas Caskey, Director and CEO of IMM and George & Cynthia Mitchell Distinguished Chair in the Neurosciences
- Dr. Irma Gigli, Walter and Mary Mischer Distinguished Professor of Molecular Medicine
- Dr. Larry Kaiser, President
- Dr. Ferid Murad, Director Emeritus, Institute of Molecular Medicine Professor of Integrative Biology and Pharmacology

Other prestigious award recipients include Dr. John Spudich, Robert A. Welch Distinguished Chair in Chemistry, who was inducted into the American Academy of Arts and Sciences in 2007, and Dr. Lorraine Frazier, first holder

of the Nancy B. Willerson Distinguished Professorship in Nursing, who was inducted into the American Academy of Nursing in 2008.

Incentives

Various Systemwide initiatives and institutional programs provide additional incentives to excel in science, technology, engineering, math, and health.

Dr. Steven Norris, microbiologist at the Medical School, received the UT System's Chancellor's Entrepreneurship and Innovation Award for research and innovation developed at multiple institutions. The award recognized his collaborative work with Dr. Alan Barbour, formerly at UT HSC-San Antonio and now at the University of California-Irvine, for discoveries leading to a diagnostic test for Lyme disease. The test is now commercially available from 11 companies that have obtained U.S. or international licenses.

UT HSC-Houston Office of Technology Management has developed a seed grant program to support early-stage projects that have a clearly defined path to the commercial marketplace. The seed grant program provides incentives to faculty to push their discoveries from the bench to the community.

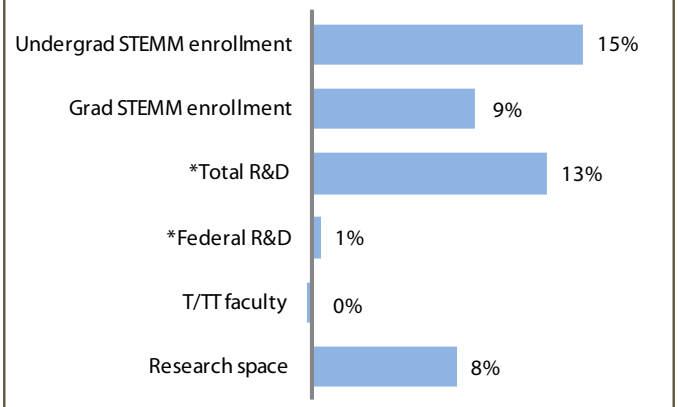
The UT System Texas Ignition Fund (TIF) is a seed-grant program to further develop inventions that need additional work to attract angel or venture capital investors and advance the invention's path toward the marketplace. The TIF program has funded two inventions at the UTHSCH.

- Dr. M. Sriram Iyengar received a TIF grant to further develop GuideView, an interactive software program that could be used, among other applications, to help non-physician care providers with step-by-step instructions for clinical guidelines in a rich format containing text, audio, images, and video animation. It supports multiple languages and runs on various devices, such as cell phones, personal digital assistants, and personal computers.
- Dr. Melvin Klegerman is using TIF funds to further develop a novel drug to dissolve blood clots for the treatment of ischemic stroke while reducing hemorrhagic side effects. The research team will demonstrate pre-clinical efficacy of the drug using rabbit models.

The University of Texas
Health Science Center at San Antonio

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $263 million to strengthen competitiveness at UT HSC-San Antonio. The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.

Indicators of Change, 2005-2008



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT HSC-San Antonio at a Glance

Student enrollment in STEMM, 2008	
Undergraduate	764
Post-baccalaureate	10
Graduate (% change since 2005)	2,286
STARs faculty recruited (2005-2008)	2
Physical space (square footage)	
Teaching	259,000
Research	533,400
Clinical	74,000
Increase in total sq. ft. through initiative	50%
New STEMM-related endowments (2005-2008)	$43.6 million
Research expenditures, 2008	$189 million
Federal research expenditures, 2008	$121 million
Intellectual property revenue, 2005-2008	$8.4 million
U.S. patents issued, 2005-2008	29
Licenses/options executed, 2005-2008	55
Start-up companies, 2005-2008	2

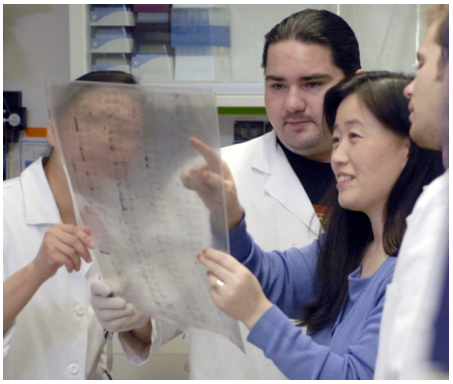
Education

Under the UT System Competitiveness Initiative, UT Health Science Center at San Antonio increased its competitiveness for student education by adding six STEMM degree programs. The expanded opportunities in communication disorders, dental laboratory sciences, dietetics, nutrition, and physical therapy have allowed UT HSC-San Antonio to set a goal of adjusting their student enrollment to meet market demands.

UTHSCSA is focused on increasing educational opportunities in science, technology, engineering, math, and medical/health (STEMM) fields to overcome the workforce shortfall predicted in the RAGS report. Undergraduate enrollment in STEMM has increased by 15 percent at UTHSCSA since 2005, adding 100 additional students, with most of this growth in nursing. This growth trend in STEMM enrollment is consistent with the 14 percent growth in undergraduate enrollment at all UT System health institutions.

Graduate enrollment in STEMM fields has increased 9 percent since 2005, adding an additional 188 students. The rate of increase at UTHSCSA is considerably larger than the 4 percent increase of STEMM graduate students enrolled at all UT System health institutions.

UTHSCSA has had a 15% increase in undergraduate STEMM enrollment and a 9% increase in graduate STEMM enrollment. This is nearly 300 additional students being trained in these critical fields.



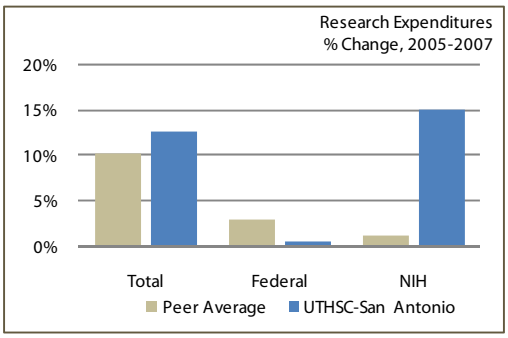
Research & Technology Development

UT Health Science Center at San Antonio has initiated several large-scale projects to support exceptional research and commercialization activities. These programs firmly establish the institution's contributions toward the UT System Competitiveness Initiative. UTHSCSA received one of fourteen 2008 Clinical and Translational Science Awards from the National Institutes of Health. The resulting Institute for Integration of Medicine and Science integrates clinical and translational research and career development across all University of Texas Health Science Center at San Antonio schools and among the following partners: CHRISTUS Santa Rosa Children's Hospital, San Antonio Metropolitan Health District, San Antonio Military Medical Center, South Texas Veterans Health Care System, Southwest Foundation for Biomedical Research, the University Health System, and the University of Texas at San Antonio. The five-year, $26 million grant will reduce barriers to research and stimulate the transformation of knowledge into improved health care.

The South Texas Technology Management office is responsible for providing technology development services to UTHSCSA, as well as UTB, UTPA, and UTSA.

UTHSCSA houses the University of Texas South Texas Technology Management (STTM), a regional technology transfer office affiliated with UTHSCSA and allied with the research departments of UT San Antonio, the UT Pan American, and UT Brownsville. STTM replaces the former UTHSCSA department, Office of Technology Ventures. STTM's mission is to provide comprehensive and integrated technology development services for its affiliates using the most effective protection and commercialization strategies to stimulate and capitalize on each University's intellectual property portfolio, thereby achieving maximum economic and humanitarian value for the Institutions, their staff, and their communities. STTM recently executed a license deal between Merck & Co., Inc., UT San Antonio, and UTHSCSA to develop a vaccine for Chlamydia. This license is the first revenue-producing license for any technology developed at UT San Antonio.

Investments in researcher and entrepreneur resources have resulted in major advances in research competitiveness indicators, often tracked by the money spent to conduct scientific investigations. Research expenditures at UT Health Science Center at San Antonio have increased at a significantly faster rate than peer institutions, totaling 13 percent between 2005 and 2007, while peers averaged a 10 percent increase. Research expenditures from federal sources increased less than one percent during the same time period while peers averaged a 3 percent increase. UT Health Science Center at San Antonio has demonstrated success in competing for extramural research funding from the National Institutes of Health, increasing NIH funding by 15 percent from 2005 to 2007 while peer institutions showed an increase of 1 percent.



Source: NSF, NIH.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include innovative buildings with advanced research laboratories and academic spaces, world-class faculty, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. The number of tenured/tenure track faculty has remained relatively stable at UT Health Science Center at San Antonio since 2005. Two world-renowned faculty members were recruited through the STARs (Science and Technology Acquisition and Recruitment) Program.

STARs Faculty

Dr. Gregg Fields, one of "2,000 Outstanding Scientists of the 21st Century" was recruited to hold one of two Robert A. Welch Distinguished Chairs in the department of biochemistry and will partner with the departments of chemistry, physics, and the school of engineering at UT San Antonio to develop a research program in nano-medicine and drug design. STARs funding totaled $1.4 million plus an additional $240,000 from the STARs Plus program. The Welch Chair at UTHSCSA has a $2 million endowment and the nanomedicine efforts with UT San Antonio include approximately $10 million in renovations by UTSA.

Dr. Tyler Curiel, an expert in ovarian cancer, was recruited to hold the Hays Chair in Oncology, serve as scientific director of the Cancer Therapy and Research Center (CTRC), and director of the San Antonio Cancer Institute, which is only one of two cancer centers in Texas to earn such designation by the National Cancer Institute. Dr. Curiel was recruited from Tulane University Medical School in New Orleans and has developed innovative approaches to cancer treatment through the use of the body's immune system. Dr. Curiel brought with him an accomplished team of 20 faculty and post-doctoral fellows. STARs funding totaled $1.25 million, matched with endowed funds, a $15 million commitment over five years by the CTRC, and an additional $20 million over ten years by the UTHSCSA.

Infrastructure

UT Health Science Center at San Antonio increased research space by 8 percent since 2005, adding over 39,000 square feet. In addition, the Competitiveness Initiative funded the construction or renovation of five facilities: the Cyclotron Addition, the Laboratory Animal Resources Renovation, the Medical Arts and Research Center, the Pre-Clinical Laboratory Renovation and the South Texas Research Facility.

Competitiveness Initiative Provides $260 million for Capital Projects at UTHSCSA

The Ruth McLean Bowers Cyclotron Wing is a $3 million addition to the Research Imaging Center located in the Robert F. McDermott Clinical Science Building. The 3,200 square foot project was completed in spring 2008 and is being used to study basic mechanisms of cognitive learning, development, and aging in animal models for human diseases. In honor of a local philanthropist's donation of $1.6 million, the wing has been named the Ruth McLean Bowman Bowers Cyclotron Wing.

The Medical Arts Research Center will serve as the institution's multispecialty faculty practice group, combining eight research and clinical locations into a single medical practice within 286,000 square feet. The $100 million project is intended to be a "one-stop-shop" for both primary and specialty patient care. Innovative elements of the facility include "clinical neighborhoods" for easy navigation by patients and physicians and concierge services for patients. The Center is 90 percent complete and is expected to be fully complete in November 2009.

The South Texas Research Facility (STRF) will add 188,000 square feet of new research space to allow significant expansion of the institution's basic and translational research programs. Research to be carried out in the $150 million building will focus on translational research in scientific areas highly relevant to South Texas (e.g. diabetes, cardiovascular diseases, infectious diseases, cancer biology including molecular therapeutics, age-related neurodegenerative disease and developing technologies to protect the nation from Bio-Terrorism). Plans for a new program in metabolic biology and regenerative medicine are also in place that will use the San Antonio Life Sciences Institute as the prime engine. An important focus of the STRF will be the training of future clinician scientists from the South Texas region at the UTHSCSA. A National Center for Integrative Sciences will be developed in this facility, creating an environment for multi-disciplinary creativity and innovation that will accelerate the pace of discovery by moving the basic discoveries of UTHSCSA and its collaborative partners into applications and products that improve human health. Construction has begun and is expected to be complete by April 2011.

The Laboratory Animal Resources Renovation provides necessary space to better suit a large and expanding animal research program. The $4.8 million project includes a 1 to 1 match from grant funding and has been completed.

Philanthropy to Support STEMM Initiatives

UT Health Science Center at San Antonio raised almost $44 million in STEMM-specific endowments since FY 2005. Almost $1.3 million is distributed for STEMM research and scholarships on an annual basis. An additional $45.6 million in gifts helped support the construction costs of the Cyclotron Addition and the South Texas Research Facility.

Faculty Awards

The faculty at UT Health Science Center at San Antonio are often recognized for their significant contributions to their fields of study. For example, since 2005 six faculty members have been inducted to the American Academy of Nursing and seven received National Institutes of Health MERIT (Method to Extend Research in Time) Awards, a true symbol of scientific achievement in the research community. MERIT awards are rare, offered to less than 5 percent of NIH-funded investigators, limited to those who have demonstrated superior competence and outstanding productivity in previous research efforts. MERIT awards provide investigators with long-term, stable research funding to foster their continued creativity without the burden of preparing frequent research grant proposals.

NIH MERIT Award Recipients

Dr. Hanna Abboud is Jay H. Stein Endowed Chair in Medicine and Nephrology, and Associate Chair of the School of Medicine. Dr. Abboud is an expert in the kidney function of people with diabetes.	*Dr. Sunil Ahuja* is professor of medicine, microbiology, immunology, and biochemistry; and director of the Veteran's Affairs Center for HIV and AIDS Infection. Dr. Ahuja is an expert in host genetics, particularly related to HIV/AIDS.
Dr. Alan Frazer is professor and chair of pharmacology and studies the cellular mechanisms for antidepressant drugs.	*Dr. Brian Herman* is vice president for research and professor of cellular and structural biology. Dr. Herman is an expert in age-related decline of physiological function, particularly in the study of programmed cell death as an explanation for age-related disease.
Dr. Peter Hornsby is professor of physiology and expert in experimental cell transplantation for therapeutic purposes.	*Dr. Alan Richardson* is professor of cellular and structural biology; director of the Barshop Institute for Longevity and Aging Studies; and principal investigator and director of the Nathan Shock Center of Excellence in Basic Biology of Aging. Dr. Richardson's expertise is in oxidative stress in aging and age-related disease such as cancer, Alzheimer's disease, and Parkinson's disease.
Dr. David Weiss is professor and chair of physiology. Dr. Weiss' expertise is in the function of specific brain receptors that have been linked to brain disorders such as epilepsy.	

Incentives

Various Systemwide initiatives and institutional programs provide additional incentives to excel in science, technology, engineering, math, and health.

Faculty at the UT Health Science Center at San Antonio received two of the three Chancellor's Entrepreneurship and Innovation Awards in 2007. Dr. Julio Palmaz, Ashbel Smith Professor, received the award for research and innovation developed at a single institution. Dr. Palmaz invented the intravascular stent used to prevent blood vessels from collapsing in patients with cardiovascular disease, which is estimated to be used in 2 million patients each year. Dr. Alan Barbour, formerly UT HSC-San Antonio and now at the University of California-Irvine, received the award for research and innovation developed at multiple institutions. The award recognized his collaborative work with Dr. Steven Norris of the UT Health Science Center at Houston, for discoveries leading to a diagnostic test for Lyme disease. The test is now commercially available from 11 companies that have obtained U.S. or international licenses.

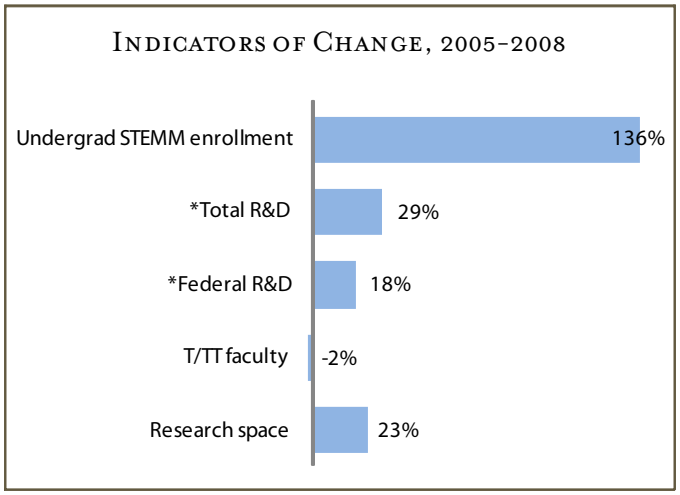
Julio Palmaz, M.D., accepts The University of Texas System Chancellor's Entrepreneurship and Innovation Award flanked by Chancellor Mark G. Yudof and Texas Senator Leticia Van de Putte.

UT HSC-San Antonio has developed a POCsparc (Proof of Concept: Short Proposals to Accelerate Commercialization) program to support early-stage projects that have a clearly defined path to the commercial marketplace. The program is administered by the UT South Texas Technology Management office. STTM awarded more than $313,000 during the first year of POCsparc. An additional $50,000 was awarded to fund two projects through Proof of Concept Roadrunner grants, which are available to UT San Antonio faculty through a supplement to the Emerging Technology Fund award that established the UT San Antonio Institute for Cyber Security.

Dr. Leonid Bunegin, Associate Professor of Anesthesiology, received a grant from the Texas Ignition Fund to further develop a technology that is used to transport organs between donor and transplant sites. The Fluidics Based Organ Preservation Device reduces costs for production and marketing and may improve transplant outcomes when compared to existing technology. Grant funds were used to complete critical experiments necessary for FDA approval of the device.

The University of Texas
M. D. Anderson Cancer Center

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $887 million to strengthen competitiveness at UT M. D. Anderson (including direct support and authorization for the institution to commit and use funds). The initial impact of these investments is presented here, organized according to the four critical elements described by RAGS: education, research and technology development, competitive capacity, and incentives.



STEMM = science, technology, engineering, math, and medical/health
* % Change, 2005-2007. Source: NSF.

UT M. D. Anderson at a Glance

Undergraduate enrollment in STEMM, 2008	203
STARs faculty recruited (2005-2008)	5
Physical space (square footage)	
Teaching	104,000
Research	712,000
Clinical	81,000
Increase in total sq. ft. through initiative	107%
New STEMM-related endowments (2005-2008)	$81 million
Research expenditures, 2008	$489 million
Federal research expenditures, 2008	$195 million
Intellectual property revenue, 2005-2008	$29 million
U.S. patents issued, 2005-2008	106
Licenses/options executed, 2005-2008	111
Start-up companies, 2005-2008	10

Education

Under the UT System Competitiveness Initiative, UT M. D. Anderson Cancer Center added three degree programs that established Bachelor of Science degrees in diagnostic imaging, magnetic resonance imaging, and computed tomography.

Undergraduate enrollment increased by 136 percent (117 students) at UT M.D. Anderson Cancer Center since 2005. This increase in STEMM enrollment is significantly more than the 14 percent growth in undergraduate STEMM enrollment at all UT System health institutions. The increase of 117 students is due to the rapidly growing School of Health Sciences that trains students in hard-to-fill disciplines.

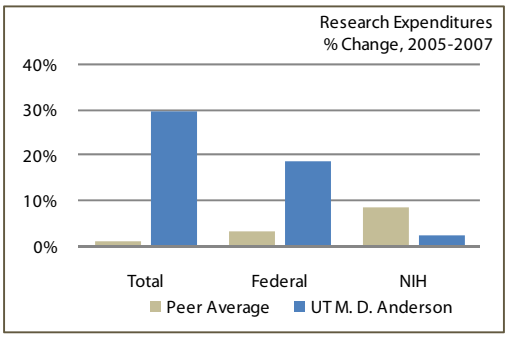
Research & Technology Development

UT M. D. Anderson Cancer Center held a seires of faculty retreats over 18 months and developed a strategic plan to promote collaborative interactions across specific areas of research and development, Implementation of the strategic plan's priorities includes the creation of five institutes for: basic science, cancer prevention and risk assessment, early detection and treatment, personalized cancer therapy and cancer care excellence. These virtual institutes build around existing divisions and departments and will speed the path to discovery by collaboration among scientists with common interests, facilitate faculty enhancement strategies, funding initiatives, and philanthropic goals. The five strategic areas are also consistent with the priorities identified by the newly formed Cancer Prevention and Research Institute of Texas established by the State of Texas to fund grants for cancer research and prevention.

UT M.D. Anderson's research results in many new procedures, devices, and drugs that lead the fight against cancer. One example of a product developed by researchers at UTMDA is a biomarker for the detection of bladder cancer. As a result of this discovery, bladder cancer can be detected in a simple, non-invasive procedure using a urine sample. The next step in the commercialization process is to develop a U.S. Food and Drug Administration (FDA) approved, commercially available test.

A second example of an invention from UTMDA is the supera biliary stent. The self-expanding stent targets diseases of the liver or gall bladder and creates a new class of self-expanding stents that provide both unsurpassed strength and flexibility in one stent design. The device has received FDA approval.

These investments in excellence contribute to enhanced resources for faculty research projects, often tracked by the money spent to conduct the scientific investigations. Research expenditures at UTMDA have increased 29 percent between 2005 and 2007, while peers averaged a one percent increase. Research expenditures from federal sources increased 18 percent during the same time period while peers averaged a 3 percent increase. Research expenditures from grants awarded by the National Institutes of Health increased 2 percent at UTMDA while peers increased 8 percent.



Source: NSF, NIH.

Competitive Capacity

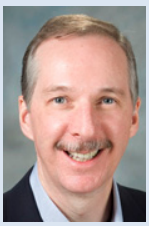
Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include innovative buildings with advanced research laboratories and academic spaces, world-class faculty, recognition programs to support faculty efforts, and interest from external donors.

Faculty Recruitment

Attracting top-caliber senior researchers who are internationally recognized for advanced breakthroughs in their field leads to major innovations in discovery, development, and application of research. UT M.D. Anderson's number of tenured/tenure track faculty decreased by 2 percent, or 10 people, between 2005 and 2008. However, the research expenditures per tenured/tenure-track faculty member grew 45 percent during this time. The STARs (Science and Technology Acquisition and Recruitment) Program enabled UTMDA to add five faculty members and retain two professors, increasing the collection of outstanding scientists at the institution.

STARs Faculty

Dr. Richard Behringer holds the Ben F. Love Chair for Cancer Research and is one of the most prominent mouse genetic/embryology researchers in the U.S. The $500,000 STARs award helped retain Dr. Behringer during an aggressive recruitment offer from the University of Pennsylvania. Additional incentives included membership in the M. D. Anderson Trust, a five-year appointment funded at $350,000 per year to encourage research.

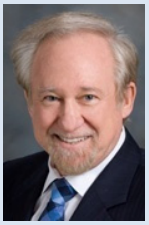


Dr. Richard Brennan is professor and Robert A. Welch Distinguished University Chair in Chemistry in the department of biochemistry and molecular biology and adjunct professor at Rice University. Dr. Brennan is a world leader in structural and biophysical analysis of DNA binding proteins. The STARs award of $1 million was matched with $450,000 of institutional start-up funds and significant laboratory and support space.

STARs Faculty

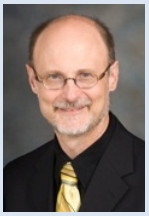
Dr. Raymond DuBois is provost and executive vice president and professor of gastrointestinal medical oncology and cancer biology. Dr. DuBois was recruited from Vanderbilt University and is recognized for identifying a crucial link between inflammation and cancer and for his work in translational research. The $1.1 million STARs award is matched by $3 million of institutional funds and substantial laboratory space to recruit non-tenure track scientists, trainees, and technicians to staff Dr. DuBois' lab.

Dr. John Ladbury is the Edward Rotan Distinguished Professor in Cancer Research and professor of biochemistry and molecular biology. Dr. Ladbury received a STARs award for $1 million to assist his recruitment from the University of London. Dr. Ladbury is part of the Genes and Development Graduate Program and is an expert in the interactions of proteins and the affinities of molecules for one another. His multidisciplinary research approach will advance UTMDA's drug development efforts.



Dr. John Weinstein is professor and chair of bioinformatics and computational biology with a joint appointment in systems biology. Dr. Weinstein received a STARs award of $900,000 for his recruitment from the National Cancer Institute where he was head of the genomics and bioinformatics group. His more than 200 publications advance areas such as new approaches to the treatment of cancer or AIDS. Dr. Weinstein will play an important role in UTMDA's institute on personalized medicine.

Dr. Miles Wilkinson is the Ruby E. Rutherford Distinguished Professor in biochemistry and molecular biology and a leading researcher in the regulatory pathways for germ cell development and the RNA surveillance pathways that correct changes that might cause developmental or immune system defects. The $670,000 STARs award helped counteract an aggressive recruitment effort by the University of Toronto and other institutions stimulated by a series of international presentations made by Dr. Wilkinson on his research findings. Dr. Wilkinson's retention package also included membership into the M. D. Anderson Trust, a five-year appointment funded at $330,000 per year to encourage innovative research and additional laboratory space. However, Dr. Wilkinson has since accepted an offer from another institution.



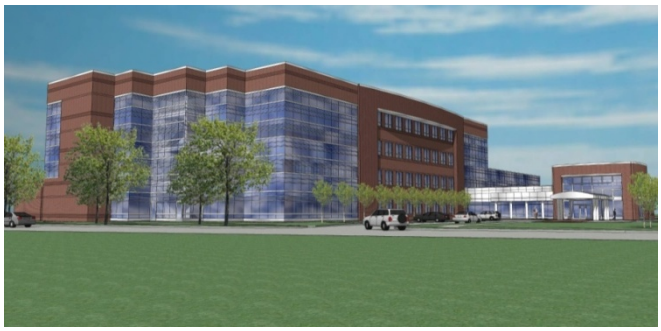
Dr. Richard Wood is professor of carcinogenesis, with internationally-recognized expertise in DNA repair mechanisms, damage responses, and genomic stability. Dr. Wood was recruited from the University of Pittsburgh's Cancer Institute Program in Molecular and Cellular Biology and has been a visiting professor at UTMDA. Dr. Wood's work has led to significant discoveries on molecular processes disrupted in cancer. The STARs award of $1.5 million was matched with additional funds to total $6.5 million over five years.

Infrastructure

New construction and renovation of state-of-the-art buildings create educational and research possibilities that drive the competitiveness initiative. Funds from the Competitiveness Initiative have been used for an expansion of the Alkek Building, Phase I of the Bastrop Facility, the Center for Advanced Biomedical Imaging Research, the Center for Targeted Therapy Research Building, the Pickens Academic Tower, Phase I of the Smithville Facility, and the South Campus Vivarium Facility. These construction projects were made possible with $374 million from Tuition Revenue Bonds, Permanent University Funds, and the Revenue Financing System; $425 million from hospital revenues; and almost $80 million from grants and gifts.

Alkek Building expansion includes five new inpatient floors with additional support space provided for pharmacy, nursing support, and additional beds in the post anesthesia care unit and the intensive care unit. The 517,000 square foot project will also renovate the existing 12th floor to address infrastructure issues associated with the current protected environment. Construction of the $321 million expansion is 35 percent complete and is expected to be fully complete in January 2013.

Phase I of the Bastrop Facility consists of 75,000 square feet of basic research laboratories, education space, primate research laboratories, pathology support, and various site and infrastructure upgrades. The $52 million project has been completed and construction has moved to Phase II.



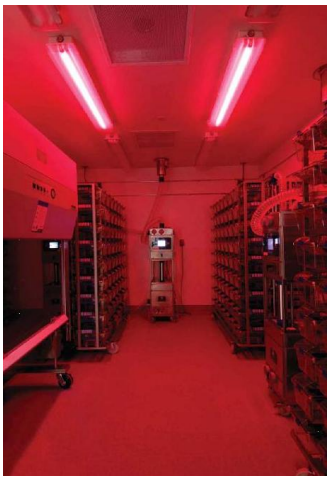
The South Campus Research Building 3 contains the Center for Advanced Biomedical Imaging Research and will be a six story building that will contain laboratories dedicated to the development and validation of sophisticated technology and instrumentation, such as Positron Emission Tomography, Magnetic Resonance Imaging, and Optical Imaging Tracers. The $132 million project received an award from the Texas Enterprise Fund to encourage scientists to work together to create new ways of diagnosing cancer and cardiac disease and selecting appropriate therapies. The 315,000 square foot facility is now 80 percent complete and is scheduled for completion in December 2009.

The South Campus Research Building 4 contains the Center for Targeted Therapy. It is a new six story research facility housing laboratories and offices for the Department of Experimental and Molecular Therapeutics as well as other translations research departments. The 209,000 square feet of new space will offer shared support laboratories such as environmental rooms, dark rooms, and shared equipment spaces as well as wet laboratories for translational research, a research medical library satellite, a distance learning center, and a support office complex for support services such as the Office of Technology Commercialization, Grants and Contracts, and Legal Services for intellectual property management. The Center for Targeted Therapy will develop and facilitate more effective partnerships and information exchange between health care providers, extramural researchers, academic institutions, and industry groups involved in early cancer detection and treatment. The $95 million project is 41% complete and is expected to be fully complete in December 2010.

Phase I of the Smithville Facility includes a new 29,000 square foot research laboratory building plus site and infrastructure upgrades. The original scope of the 29,000 square foot project is complete, with a project cost of over $30 million.

Competitiveness Initiative Provides $879 million for Capital Projects at UTMDA

The T. Boone Pickens Academic Tower will provide 21 stories and 730,000 square feet of space for faculty and various administrative functions including executive and administrative offices. Additional amenities include food service, fitness center (future), and training center. Skybridges will connect the Tower to the Faculty Center and the Mays Clinic skybridge. The construction of the $173 million project is being completed in phases and the first occupancy phase began in spring 2008.



The South Campus Vivarium Facility provides almost 66,000 gross square feet of new and renovated space for the animal research facilities. The Vivarium will be built in existing warehouse and vivarium space in the Physical Plant Building and adjoining the Smith Research Building. Existing animal facilities will also be renovated as part of the $45 million project.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UT M. D. Anderson raised $81.4 million in STEMM-specific endowments since FY 2005, including graduate fellowships, distinguished chairs to support faculty research, and student scholarships. Over $2 million is distributed for STEMM research and scholarships on an annual basis from these new endowments.

Faculty Awards

The faculty at UTMDA are unmatched as leaders in cancer research and often are recognized for their significant contributions to their areas of expertise and respective fields of study. For example, two professors were named fellows of the American Academy of Nursing and one has a NIH MERIT (Method to Extend Research in Time) Award, a true symbol of scientific achievement in the research community. MERIT awards are rare, offered to less than 5 percent of NIH-funded investigators, limited to those who have demonstrated superior competence and outstanding productivity in previous research efforts. MERIT awards provide investigators with long-term, stable research funding to foster their continued creativity without the burden of preparing frequent research grant proposals. Dr. Raymond DuBois has a MERIT award through 2013 for his research in the regulation of intestinal wall cell growth.

Incentives

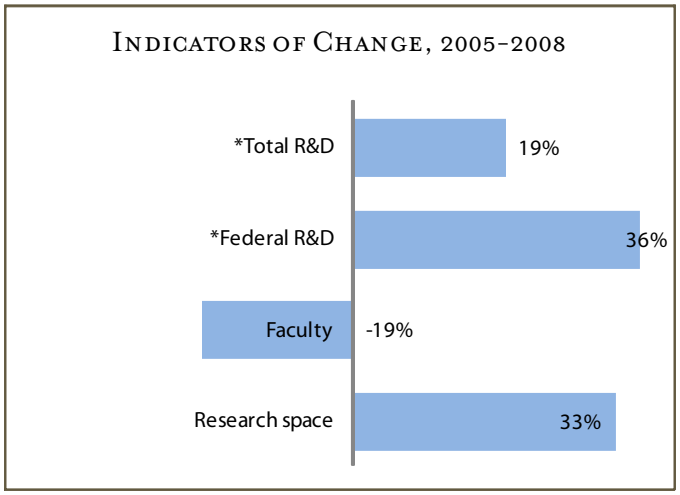
Various Systemwide initiatives and institutional programs provide additional incentives to excel in science, technology, engineering, math, and health.

The UT System Texas Ignition Fund (TIF) has funded projects to commercialize three inventions at the UTMDA.

- A new therapeutic platform for widespread application of genetically manipulated cells, focusing on rare diseases with high treatment costs.
- An aerosolized lung stimulant drug that promotes immune response and protects against specific infections.
- A drug that significantly decreases radiation exposure to patients with prostate cancer while increasing the accuracy of treatment, which reduces side effects and improves clinical outcomes.

The University of Texas
Health Science Center at Tyler

The UT System has responded to the challenge set forth by the Rising Above the Gathering Storm (RAGS) report and has committed more than $42 million to strengthen competitiveness at UT HSC-Tyler (including direct support and authorization for the institution to commit and use funds). The initial impact of these investments is presented here, organized according to the critical elements described by RAGS: research and technology development, competitive capacity, and incentives.



* % Change, 2005-2007. Source: NSF.

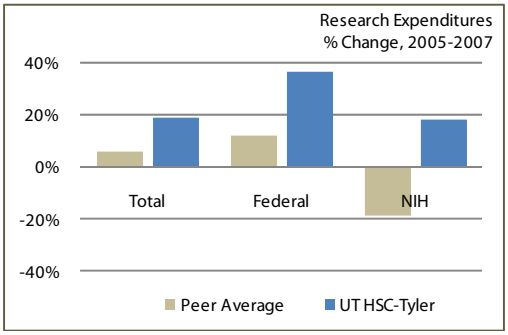
UT HSC-Tyler at a Glance

Physical space (square footage)	
Teaching (clinical training)	8,500
Research	52,800
Clinical	4,700
Increase in total sq. ft. through initiative	51%
New STEMM-related endowments (2005-2008)	$972,000
Research expenditures, 2008	$13.7 million
Federal research expenditures, 2008	$6.4 million
Intellectual property revenue, 2005-2008	$24 thousand
U.S. patents issued, 2005-2008	1
New invention disclosures, 2005-2008	4

STEMM = science, technology, engineering, math, and medical/health

Research & Technology Development

Investments in UT Health Science Center at Tyler contribute to enhanced resources for faculty research projects, often tracked by the money spent to conduct the scientific investigations. Research expenditures at UT HSC-Tyler have increased at a significantly faster rate than peer institutions, totaling almost 19 percent between 2005 and 2007, while peers averaged an almost 6 percent increase. Research expenditures from federal sources increased 36 percent during the same time period while peers averaged a 12 percent increase. Research expenditures from grants funded by the National Institutes of Health also were substantially different between UTHSCT and its peers: UTHSCT increased almost 18 percent while peers averaged an 18 percent decrease.



Source: NSF, NIH.

Research conducted by faculty at UT HSC-Tyler leads to significant discoveries and applications for use in clinical settings. For example, Drs. Rakesh Srivastava and Sharmila Shankar, UTHSCT cancer biologists, have discovered specific compounds that attach to the "death receptors" on the surface of cancer cells and force them to die. The molecules kill tumor cells but spare normal cells that do not have the same kind of receptors. For this reason, the novel compound is better than chemotherapy in the treatment of cancer. The National Institutes of Health Rapid Access to Interventional Development has tested the full scope of the responsive tumors and clinical trials are expected to begin soon. A patent is pending for this discovery.

Another example is the discovery of a molecule, named scuPA, which is a nonsurgical alternative treatment for clearing scarring and adhesions between the lung and chest wall. Other drugs currently used for this purpose do not always work and have the side effect of bleeding, which leads physicians to choose surgery over drug treatment. UTHSCT's discovery can improve treatment outcomes for over 40,000 U.S. patients annually. A patent has been issued for scuPA

and clinical trials are expected to begin soon. The discovery is a product of work conducted by the UTHSCT Texas Lung Injury Institute and Dr. Steve Idell's research project funded by the National Institutes of Health.

Competitive Capacity

Competitive capacity, or the resources necessary to advance academic and research goals, is a fundamental building block for institutional activities. Resources include innovative buildings with advanced research laboratories and academic spaces, world-class faculty, recognition programs to support faculty efforts, and interest from external donors.

Research and Clinical Faculty

UT HSC-Tyler is committed to enhancing the prestige of its research program, which requires ongoing growth of research and clinical faculty in strategic areas of expertise. To build on existing research and clinical strengths, new faculty will be recruited in lung injury, infectious lung diseases, and cancer.

Infrastructure

New construction and renovation of state-of-the-art buildings create educational and research possibilities that drive the competitiveness initiative. UTHSCT increased research space by 33 percent since 2005, adding over 13,000 square feet. In addition, the UT System Competitiveness Initiative supports one new facility, the Academic Center. Phase I of the $42 million new construction will add a three-floor building with over 78,500 gross square feet with a two level lobby pavilion that connects to the existing main hospital complex. The first floor will be designated for use as a Cancer Research and Treatment Area. The second and third floors will be shell space for future Residency Program Clinic and Academic and Conference Center. The project includes over $21 million in tuition revenue bonds, $10 million in Permanent University Fund bonds, almost $5.9 million in revenue financing system bonds, and $5 million in designated funds.

Philanthropy to Support STEMM Initiatives

A compelling indicator of competitiveness is the institution's appeal to philanthropists who join the institution's commitment to excellence. UTHSCT raised almost $1 million in endowments since FY 2005 that could be used to support research and clinical initiatives at the institution. Over $26,000 is distributed on an annual basis.

Incentives

Various programs provide additional incentives to excel in science, technology, mathematics, and health. The UT System Texas Ignition Fund has funded one invention at UT HSC-Tyler to complete clinical trials of scuPA, the molecule that is a nonsurgical alternative treatment for lung scarring (described above).

Note

STEM(M) is short for science, technology, engineering, math, (and medical/health). Although STEMM is used consistently throughout these summaries, when discussing enrollment it is defined differently for the academic and health institutions.

ACADEMIC institutions and STEMM. When discussing STEMM enrollment for UT System academic institutions, System is actually using the more traditional STEM definition used by the National Science Foundation, which does not include nursing or health professions students.

Enrollment by the academic institutions in nursing or health professions is considered separately.

The National Science Foundation STEM Classification of Instructional Programs includes agricultural sciences, chemistry, computer science, engineering, environmental science, geosciences, life/biological sciences, mathematics, and physics/astronomy.

More detailed information on these can be found at:
http://chaffee.qrc.com/nsf/ehr/lsamp/help/help_stem_cip_2000.cfm

HEALTH institutions and STEMM. When discussing STEMM enrollment for UT System health institutions, System is including all students at those institutions.

For more information and detailed data please visit
www.utsystem.edu/competitive