



TEXAS BIOTECHNOLOGY AND LIFE SCIENCES

WHY TEXAS?

THE TEXAS ADVANTAGE

As the 10th largest economy in the world, Texas is an economic engine that continues to lead the nation in job creation and innovation. Texas' unparalleled combination of business advantages include a business-friendly environment, first-class infrastructure, highly-skilled workforce, fair legal system, overall economic strength and a high quality of life—truly making Texas the best state for business.

Home to 50 Fortune 500 companies, Texas has the second largest civilian workforce in America—13 million industrious people. And with no corporate income tax and no individual income tax, Texas has one of the lowest tax burdens in the country.

In addition, Texas' strategic location in the center of the country, abundance of available resources and affordable real estate serves as a major draw for companies looking to locate or expand their business. Texas is truly wide open for business.

Chief Executive
BEST STATES
FOR BUSINESS



2017 Best State for Business for the 13th Straight Year

Chief Executive Magazine



2016 Governor's Cup Winner

Site Selection Magazine



"Top of the Tops" State for Business over the last decade

CNBC



2016 State of the Year

Business Facilities Magazine



2016 Silver Shovel Award Winner

Area Development Magazine



Texas is the 10th largest economy in the world based on GDP, ahead of Australia, Mexico, Spain, South Korea and Russia.



Texas is the nation's leader in job creation adding 1.82 million jobs in the last 10 years as of December 2015.



Based on number of jobs, Texas ranks No.1 in the nation for foreign and domestic investment.



Texas has the second largest civilian workforce in America—13 million industrious Texans.



No personal or corporate income taxes.



Texas is the nation's top exporter for the 15th consecutive year with exports valued at over \$232 billion.

LIFE SCIENCE IN TEXAS

Texas is home to over 4,000 life science R&D and manufacturing firms, with over 100,000 workers employed in related fields.

TEXAS: GLOBAL LIFE SCIENCE POWERHOUSE

Home to more than 4,000 life science and research firms, and approximately 100,000 workers in related fields, Texas is one of the leading life science states in the country.

Top Fortune 500 companies such as Kimberly-Clark and Celanese are based in Texas, while top global industry leaders such as McKesson, Galderma, Novartis, Abbott, Allergan, Lonza, Johnson & Johnson and Medtronic, among others, have major operations in the state.

Texas' highly trained workforce, top-tier research institutions and business-friendly climate strengthens the state's status as a global life science industry leader.

WORLD'S LARGEST MEDICAL CENTER

The Texas Medical Center (TMC) is the world's largest medical complex, and is also home to the world's largest children's hospital—the Texas Children's Hospital—and the world's largest cancer hospital—MD Anderson Cancer Center.

Since opening in 1945, TMC has been at the forefront of advancing life sciences through pioneering patient care, research, education and prevention. Today, TMC comprises: 21 renowned hospitals, 14 support organizations, 10 academic institutions, eight academic and research institutions, seven nursing programs, three public health organizations, three medical schools, two pharmacy schools and a dental school.

No.1

World's Largest
Medical Center

No.1

Medical/Clinical Lab Technologists
& Chemical Engineers

4

NCI-Designated
Cancer Centers

6

Medical Schools in
Nation's Top 100

\$2.5B

Annual Research &
Development Expenditures

22,160

Clinical Trials Underway
(3rd nationally)

TOP LIFE SCIENCE COMPANIES IN TEXAS

Select firms with corporate management, research or manufacturing facilities in the state.



Top Texas-Based Biotechnology Firms (by Global Revenues)

 **Kimberly-Clark**

Respiratory healthcare products
HQ: Irving Sales: \$19.7 billion

 **Celanese**

EVA polymer-based medical care products
HQ: Irving Sales: \$6.8 billion


Acelity
 **Greatbatch**


Medical devices
HQ: San Antonio Sales: \$2.9 billion

Medical device technologies
HQ: Frisco Sales: \$687.7 million

Neuromodulation medical device
HQ: Houston Sales: \$282 million

BIOTECHNOLOGY IN TEXAS



In April 2017, Texas ranked No. 1 nationally for Medical & Clinical Lab Technologists, employing 12,380 people, and No. 1 for Chemical Engineers.

BIOTECHNOLOGY IN TEXAS

Home to more than 1,200 biotechnology-related manufacturing and R&D firms, Texas is a national leader in biotechnology—and dozens of global biotech companies, such as Novartis, Abbott, Celanese, Kimberly-Clark and Medtronic, have major operations in the state.

More than 31,000 workers are employed in biotech-related sectors in Texas, with an average annual salary of more than \$109,000—which continues to increase steadily year-over-year.

In April 2017, the most current data available, Texas ranked No. 1 nationally for Medical & Clinical Lab Technologists, employing 12,380 people, and No. 1 for Chemical Engineers, accounting for 6,970 jobs in Texas.

Texas' concentration of highly trained biotech workers, multiple top-tier research institutions and a competitive, business-friendly climate all strengthen the state's status as a biotechnology leader.

Biotechnology Employment in Texas, Third Quarter 2016

Sector (NAICS Code)	Employment	Firms
Medical and Diagnostics Lab (6215)	22,847	1,042
Testing Laboratories (54138)	16,932	779
Physical, engineering & biological research (54171)	21,356	1,126
Medical equipment & supplies manufacturing (3391)	11,999	668
Pharmaceutical & medicine manufacturing (3254)	11,671	136
Other basic organic chemical manufacturing (32519)	7,851	90
Agricultural chemical manufacturing (3253)	2,812	80
Electro-medical apparatus manufacturing (334510)	2,137	46
Analytical laboratory instrument mfg. (334516)	1,529	33
Total	99,134	2,874

Texas' Top Rankings for Biotechnology Workers in the U.S

No. 1	Medical & Clinical Lab Technologists
No. 1	Chemical Engineers
No. 1	Ophthalmic Medical Technicians
No. 1	Veterinary Technologists & Technicians
No. 2	Pharmacy Technicians
No. 3	Animal Scientists
No. 3	Environmental Scientists & Specialists
No. 4	Soil & Plant Scientists

ANIMAL & AGRICULTURAL BIOTECH

Texas has been at the forefront of animal and agricultural research for over 100 years. As the nation's leading producer of cattle and cotton, and the No. 3 overall producer of agricultural products in the U.S., Texas is the natural choice for agricultural biotechnology. The state is also home to established agricultural feedstock and chemicals manufacturing industries concentrated in the Texas Panhandle and Gulf Coast regions.

The Lone Star State is home to world-class agricultural education and research facilities, particularly through the Texas A&M and Texas Tech University Systems—and Texas is ranked No. 1 nationally for Agricultural Sciences Doctorates by the National Science Foundation. Furthermore, Texas A&M has long led the nation in graduating more students in animal and agricultural-related fields than any other institution.

AGRIBUSINESS INDUSTRY LEADERS CONTINUE TO INVEST IN TEXAS COTTON RESEARCH & DEVELOPMENT

Because Texas is the nation's largest producer of cotton, the state is a natural location for the R&D operations of Fortune 500 agribusiness firm **Monsanto**, recently purchased by Bayer. The Missouri-based company has nine locations in Texas, including a research farm outside of Lubbock and testing centers in Haskell and near Corpus Christi.

In 2010, Monsanto opened the \$10.5 million Texas Cotton Breeding and Technology Center in Lubbock. The “research megasite” exemplifies its commitment to the Texas cotton industry and to developing varieties adapted to the region.

Monsanto, however, is not the only global agricultural biotech firm in Texas. Since 1998, German conglomerate Bayer has operated its **Bayer CropScience** division's global cotton headquarters in Lubbock. The company has eleven facilities in and around the region, including a state-of-the-art R&D lab, two breeding stations, a seed processing plant, seed warehousing facility, quality assurance lab, and it supports two of its global cotton seed brands, Stoneville and FiberMax.

In September 2014, Bayer CropScience announced plans to invest approximately \$90 million in its Cotton Research & Development Laboratory in Lubbock as part of a \$1 billion nationwide R&D ramp up.

Both Monsanto and Bayer CropScience have developed cotton R&D partnerships with Texas universities, including two of the state's leading research institutions, Texas Tech University (TTU) and Texas A&M University.

TEXAS' LEADING AGRICULTURE BIOTECH RESEARCH CENTERS

Texas A&M, Dept. of Soil & Crop Sciences: The department is one of the largest such facilities in the world with a global reputation. It develops technologies to sustain environmentally and economically sound production systems and promotes the wise use and management of soil, plant and water resources.

Texas A&M AgriLife Research: Serves as the state's premiere R&D agency in agriculture, natural resources and the life sciences with 13 statewide regional centers and over 500 doctoral-level researchers.

Texas Tech University, Animal & Food Sciences Dept., Burnett Center for Beef Cattle Research: The Center's scientists are leaders in the study of beef cattle feeding and management.

Texas A&M, College of Veterinary Medicine & Biomedical Sciences: The sole veterinary college in Texas focuses disciplines including infectious diseases, toxicology and environmental health science, cardiovascular sciences, neurosciences and reproductive biology.

MEDICAL DEVICES

More than 714 firms employ approximately 11,900 highly skilled workers in this sector, making Texas the No. 8 state in the nation for its medical device labor force.

Many of the biggest players in the medical equipment and supplies industry have corporate facilities in Texas. More than a dozen Fortune 1000 medical device giants alone have manufacturing or management operations in the state, including Abbott Laboratories, Agilent Technologies, Baxter International, Becton Dickinson, CareFusion, GE, Johnson & Johnson, Medtronic, St. Jude Medical, Stryker, Thermo Fisher Scientific and Zimmer.

These companies and many others have developed a robust medical equipment and supplies workforce

in the state. More than 714 firms employ approximately 11,900 highly skilled workers in this sector, making Texas as one of the top 10 states in the nation for its medical device labor force.

A wide range of medical products are developed and produced in Texas, from surgical sutures and bandages, to molecular biology kits and medication delivery systems. While a broad spectrum of medical specializations are served by Texas device companies, the state has developed several unique clusters, including ophthalmology, orthopedics, cardiology, diagnostics and wound care.

Top 10 Medical Device & Equipment Companies with Texas Operations

By Parent Company Global Revenues

Company Name	Primary Locations	Specialization
GE Medical Systems (General Electric)	El Paso	Cardiology products
Hitachi High Technologies America	Dallas	Lab instruments
Ethicon (Johnson & Johnson)	San Angelo	Surgical supplies
Alcon Research (Novartis)	Houston	Ophthalmic products
Flextronics	Irving, Plano	Contract design & manufacturing
Dunlee (Philips)	Arlington	Radiology & imaging products
Abbott Laboratories	Irving	Diagnostics
Kimberly-Clark	Irving	Respiratory (disposables)
Medtronic	Fort Worth, San Antonio	Surgical devices & diabetes management
Thermo Fisher Scientific	Austin	Diagnostics

PHARMACEUTICALS

Texas ranks third nationally for number for clinical trials, with approximately 22,160 studies underway.

A growing number of global pharmaceutical companies have established research and production facilities in Texas, including UK-based Actavis (formerly Allergan), UK-based Mylan and Switzerland's Lonza.

Additionally, Texas has also fostered the headquarters of homegrown pharmaceutical successes like Fort Worth's ophthalmic leader Alcon Laboratories—now part of global pharma giant Novartis—and wound care innovator Smith & Nephew Biotherapeutics.

These companies and many others have developed a substantial pharmaceutical manufacturing workforce in the Lone Star State. Approximately 180 firms now employ more than 11,800 workers in the sector, making Texas one of the top states in the nation for number of pharmaceutical manufacturing workers.

Texas is also a leading pharmaceutical research state. In Spring 2017, Texas ranked third nationally for number for clinical trials, with approximately 22,160 studies underway according to the National Institute of Health.



Texas-Made Pharmaceutical Products

A wide variety of consumable pharmaceuticals and pharmaceutical products are manufactured in Texas, including leading products ranging from Alcon's eye care products to Omega Protein's nutritional products.

BIOMEDICAL RESEARCH & DEVELOPMENT



In 2014, Texas higher education institutions expended nearly \$2.5 billion on life science R&D.

RESEARCH & DEVELOPMENT

Research and development (R&D) is the lifeblood of the biotechnology industry. The state's leading companies, medical centers and institutes of higher learning continue to churn out innovations that keep Texas on the cutting edge of discovery.

Texas is home to top-ranked biotechnology and medical research institutions, federally designated centers, innovative research collaborations and some of the world's largest medical complexes.

In Texas, the R&D pipeline is supplied in part by the state's vast network of public universities and health-related institutions, which invest heavily in R&D and intellectual property generation. In 2014 alone, Texas public institutions of higher education spent nearly \$2.5 billion on medical and life sciences research, accounting for more than 56% of all higher education R&D expenditures in the state.

Public investment in biotechnology and research is complemented by the state's substantial cluster of private sector R&D activity. In fact, over 700 private scientific R&D firms that employ more than 11,900 workers are based in Texas. Many of the world's largest private biotech R&D firms have operations in Texas, including PPD, Covance, Quintiles, INC Research and Shin Nippon Biomedical Laboratories' SNBL USA subsidiary.

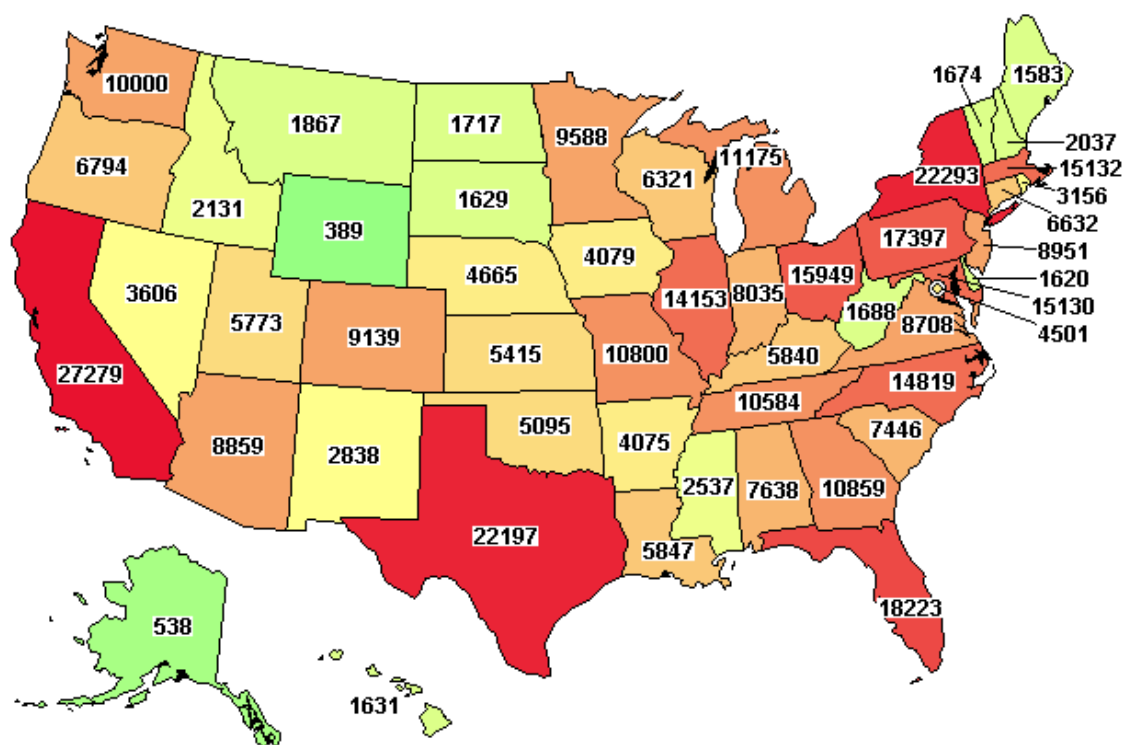
In addition to R&D facilities, Texas has more than 1,700 medical and testing laboratories, which include blood, pathology, imaging, diagnostics and device testing. These laboratories employ more than 34,200 in Texas. Major lab firms in the state include LabCorp's Esoterix subsidiary, Spanish biological product firm Grifols, and Sonic Healthcare's Clinical Pathology Laboratories subsidiary.

There are more clinical trials conducted in the Texas Medical Center than any other single site in the world.

***-Dr. Robert Robbins,
President & CEO
Texas Medical Center***

Texas ranks No. 3 in the nation for number for clinical trials, with approximately 22,160 underway.

Clinical Trials by State, Spring 2017



TEXAS CANCER RESEARCH CENTERS RACING FOR THE CURE

Texas is a national leader in cancer research. The Cancer Prevention Research Institute of Texas (CPRIT), based in Austin, is the second-largest taxpayer-funded cancer research organization in the country. Since its inception in 2007, CPRIT has awarded 1,070 grants totaling more than \$1.67 billion, with approximately \$45 million dedicated to academic research grants.

Texas is also home to 4 NCI-Designated Cancer Centers, including the University of Texas MD Anderson Cancer Center, which ranks No.1 for cancer care by the U.S. News & World Report's annual "Best Hospitals" survey—a distinction it's held for 12 of the past 15 years. Other major institutions include the Scott & White Cancer Institute in Temple, as well as Dallas-based Texas Oncology and the Mary Crowley Cancer Research Centers.

THE TEXAS MEDICAL CENTER INNOVATION INSTITUTE

The Texas Medical Center (TMC) Innovation Institute aims to become the global leader in life sciences innovation and commercialization:

TMCx – The Texas Medical Center Accelerator (TMCx) facilitates development of early-stage digital health and medical device companies. TMCx resources include co-working space and a network of more than 120 advisors including clinical experts, researchers and executives.

TMCx+ – Located adjacent to the TMCx Accelerator, TMCx+ provides essential amenities required by early stage companies including secure office space, conference rooms and a recombinant research environment.

JLABS@TMC – Part of Johnson & Johnson Innovation LLC, JLABS is a network of incubators providing emerging pharmaceutical, medical device and consumer and digital health companies.

TEXAS LIFE SCIENCE WORKFORCE

Texas has the second largest workforce in the country, and is also home to one of the largest clusters of life science professionals in the U.S.

Texas has the second largest workforce in the country, and is also home to one of the largest clusters of life science professionals in the U.S. With more than 80 higher education institutions and medical universities, 5,000 industry-related graduates annually and a current workforce of nearly 100,000—Texas can readily supply life science companies with a highly-skilled pool of talent.

Texas ranks #1 nationally for Medical & Clinical Lab Technologies and Chemical Engineers, which combined account for nearly 20,000 jobs in Texas. And in 2016, U.S. News & World Report ranked six Texas schools among the nation's top 100 research medical schools.

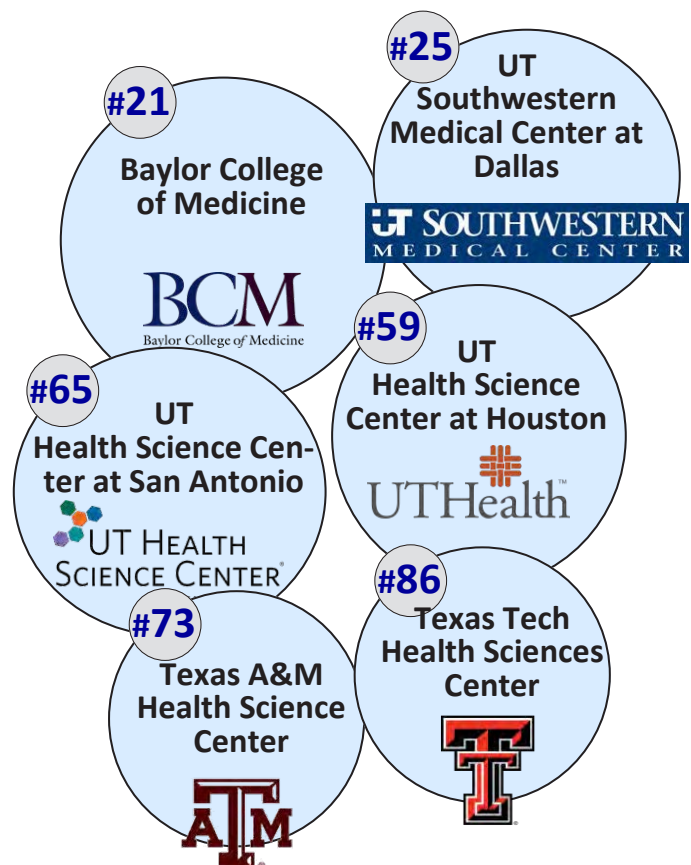
EXPANDING MEDICAL SCHOOL SYSTEMS

Texas is home to 11 medical universities, and is continuing to expand its network with the addition of two new medical schools. The Dell Medical School at the University of Texas – Austin, which welcomed its inaugural 50-person class in June 2016, is the first MD-training institution in nearly 50 years to be built from the ground up at a top-tier U.S. research university.

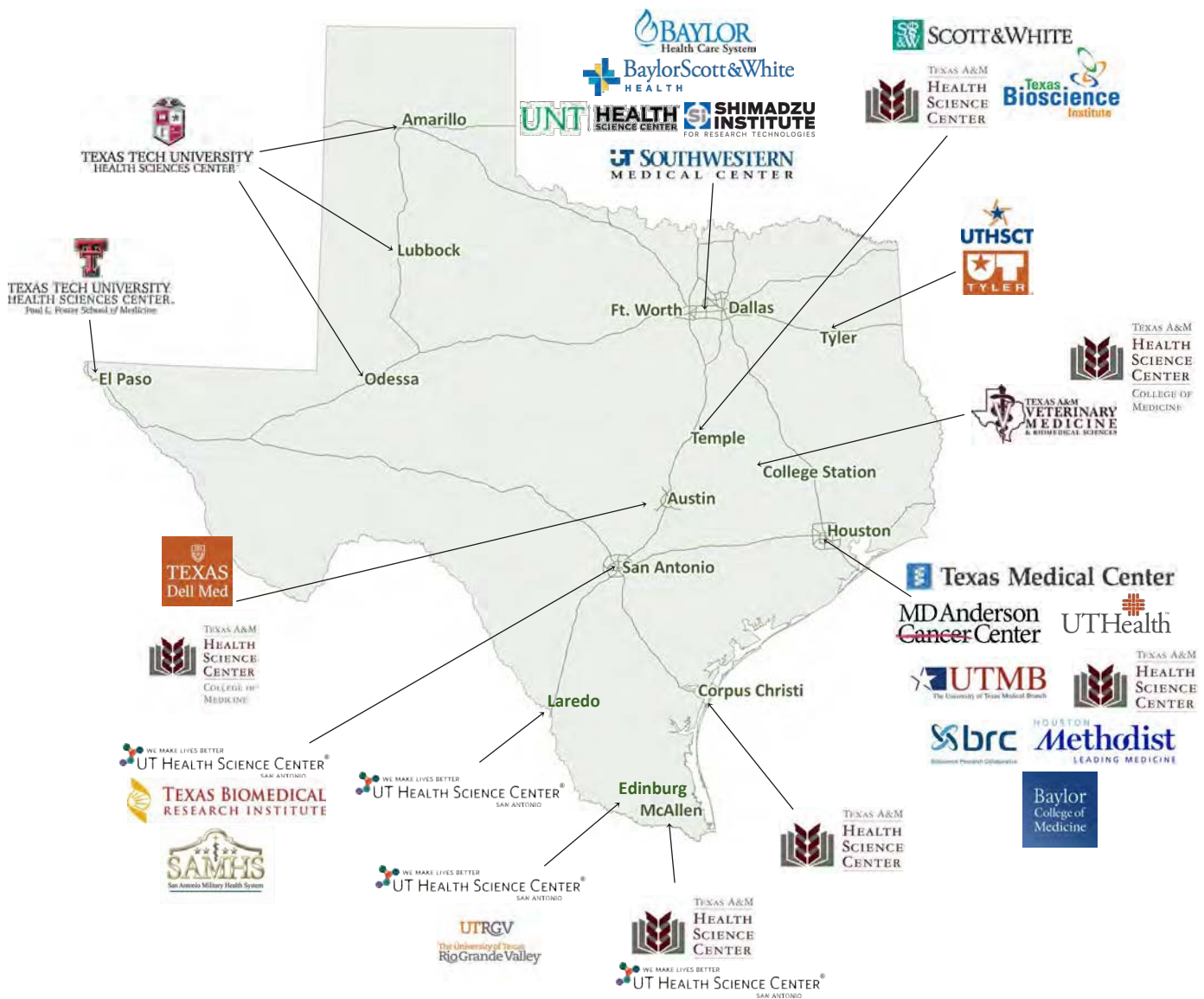
North Texas will also be home to another MD program when Texas Christian University and the UNT Health Science Center team up to welcome their first class in fall 2018.

Texas Places Six Research Medical Schools in Top 100

In 2017, U.S. News & World Report ranked the nation's top 100 research medical schools. Texas landed six schools on the list:



MEDICAL SCHOOLS & SELECTED RESEARCH CENTERS



Texas is Top Tier for Biotech-Related Doctorates

In 2015, the National Science Foundation ranked Texas among the top 10 U.S. States for number of doctorates awarded in biotech-related fields:

- No. 1** for agricultural sciences doctorates
- No. 2** for health sciences doctorates
- No. 2** for life science doctorates
- No. 3** for all doctorates awarded
- No. 3** for biological/biomedical sciences doctorates

STATE INCENTIVES & INITIATIVES



Texas Enterprise Fund – The Texas Enterprise Fund (TEF) is one of the nation’s largest “deal closing” funds created to attract businesses and new jobs to Texas. Since 2004, the TEF has awarded \$118 million to life science-related companies, which have committed to create 13,706 jobs in Texas.

Governor’s University Research Initiative – In 2015, Governor Greg Abbott passed legislation to create a new Governor’s University Research Initiative (GURI), which allocated \$40 million to attract and recruit top researchers to Texas’ higher education institutions.

Cancer Prevention and Research Institute of Texas (CPRIT) – Launched in 2007, CPRIT awards grants to Texas organizations and institutions for cancer-related academic research and product development research and for the delivery of cancer prevention programs and services. To date, CPRIT has awarded 1,132 grants totaling more than \$1.79 billion.

Stem Cell Regulation – The Texas Medical Board approved new guidelines in 2012 for the use of experimental stem cell therapies. The guidelines stipulate that the stem cell procedures are done for research only, that they receive approval from a public or private institutional research board and that patients sign consent forms. Texas joins other states such as California, New York and Illinois in the enactment of rules for governing stem cell research.

R&D Credit Regulation – In 2013, Texas signed a law to reinstate franchise tax credits for companies conducting qualified research activities (QRAs) for Texas companies. The law provides Texas companies the option of selecting

either a sales tax exemption on property purchased by persons engaged in QRAs or the franchise tax credit, but not both. Both the sales tax exemption and research credit are extended through 2026.

Product Development & Small Business Incubator Loan Program (PDSBI) – The Program offers long-term, asset-backed loans to near-bankable businesses developing and/or commercializing new or improved products, small businesses, non-profits, and small business incubators and accelerators, with preference given to entities in the areas of semiconductors, nanotechnology, biotechnology, biomedicine, and other emerging technologies.

CONTACT US



Office of the Governor Economic Development and Tourism Division

The Governor’s Office of Economic Development and Tourism (EDT) serves as the state’s leading economic development organization marketing Texas as the world’s premier business investment destination. The division pursues business expansion and relocation prospects, with the goal of developing job creation and export opportunities for the Texas business community.

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