



## Overview and Summary of Recent Initiatives

Bioscience is among six technology sectors targeted by Governor Rick Perry's Industry Cluster Initiative. The biotechnology and life sciences cluster strategy was updated most recently in an assessment report issued in August 2005. Biotechnology, medicine, and life sciences are also among the 13 sectors targeted for support through the \$200 million **Texas Emerging Technologies Fund (ETF)** created in 2005 (HB 1765) in Governor Perry's office, pursuant to the 2002 report of the Governor's Council on Science and Biotechnology Development. The ETF is loosely modeled on the Texas Enterprise Fund, a \$300 million deal-closing discretionary economic development fund also run through the Governor's office. However, the ETF is a multifaceted program, with aspects of both research capacity-building and commercialization support (see below).

Since the last BIO report, ETF has rolled out seven regional Centers of Innovation and Commercialization, which forward funding recommendations to the ETF Committee. As recommended by the latest cluster-strategy update, a separate, statewide **Texas Life Science Center of Innovation and Commercialization** will act as the gateway through which applications for funding in the biosciences are submitted and recommended to the ETF.

The state also restored funding for the **Advanced Research Program** operated by the Texas Higher Education Coordinating Board, which also disburses formula support for capacity building through the **Research Development Fund**. Regionally, bioscience continued to play an important role in the development strategies of Houston, Dallas/Fort Worth, Austin, Lubbock, and San Antonio.

## Building Bioscience R&D Capacity

### Recent state investments in facilities

In 2005 the Texas Enterprise Fund awarded \$50 million for start-up costs of a **Texas Institute for Genomic Medicine**, a new nonprofit involving the Texas A&M University Institute of Biosciences and Technology (IBT) in Houston; the main Texas A&M campus in College Station; and Lexicon Genetics, a private firm. Lexicon will create a comprehensive knockout mouse embryonic stem cell library. Copies of the library will be deposited both at a \$5 million remodeled facility at the IBT at the Texas Medical Center in Houston and at a new \$15 million commercialization facility to be constructed at College Station. Other recent state-supported research facilities at College Station include the following:

- \$95 million **Interdisciplinary Life Sciences Building**
- \$14 million **Veterinary Research Building Addition**

- \$5 million **NMR Facility**
- \$5 million **Laboratory Animal Resources and Research Facility Expansion.**

The University of Texas (UT) system also continued a \$3 billion construction program that included significant new bioscience facilities across multiple campuses approved by past legislative sessions. Examples both recently completed and still in progress include the following:

- UT Austin **Neural and Molecular Sciences Building** (\$60 million)
- UT Austin **Biomedical Engineering Building** (\$55.1 million)
- UT Medical Branch at Galveston **National Biocontainment Laboratory** (\$167.1 million)
- UT Medical Branch at Galveston **Research Facilities** (\$77.1 million)
- UT MD Anderson **Basic Sciences Research Building** (\$221.9 million)
- UT Houston Health Science Center **Saroffm Research Building** (\$110.6 million)
- UT Houston Health Science Center **Research Facility** (\$80 million)
- UT Southwestern Medical Center **Laboratory Research Building** (\$25 million)
- UT San Antonio **Biotechnology, Sciences and Engineering Building** (\$94 million)
- UT San Antonio **Medical Research Division** (\$20 million)
- UT El Paso **Bioscience Facility** (\$30.5 million)
- UT Dallas **Center for Brain Health** (\$14.6 million).

### Research programs

The Texas Higher Education Coordinating Board operates an \$8.3 million **Advanced Research Program**, a competitive grant program open to researchers at public universities. Biological sciences will receive \$3 million as one of six fields targeted for support. Grants are made up to \$100,000 over 2 years.

The ETF sets aside 25 percent for a **Research Grant Matching Program** that assists institutions in leveraging federal or private resources. However, successful proposals must include involvement of a commercial entity ready to assist in commercialization if the subject research is successful.

### Faculty development programs

The ETF sets aside 25 percent for a **Research Capacity Program**. The law defines this as including recruitment of faculty research groups from out of state.

The Texas Higher Education Coordinating Board also will distribute \$42.7 million over 2006 and 2007 through the formula-based **Research Development Fund** to allow public universities to increase research capacity. Bioscience development is a significant share of the program.

## Encouraging Academic/Industrial Interaction

Half the ETF is set aside for a **Commercialization Grant Program** that encourages university/industry collaboration and requires that inventions discovered jointly be commercialized or manufactured in-state to the extent possible.

## Moving Technology into the Marketplace

### Commercializing university technology

In Houston, **BCM Technologies** is a for-profit commercialization company wholly owned by Baylor College of Medicine. It was created to work with the university licensing office to create start-up companies to which intellectual property can be licensed. BCMT essentially manages a \$20 million fund set up by the BCM endowment to make early-stage investments in these start-ups, along with regional investors. To date 13 companies have been established this way, of which seven have become public companies.

In 2005 the Board of Regents for the Texas A&M University system authorized creation of the first system-level office of technology commercialization.

### Supporting bioscience entrepreneurs and emerging companies

In San Antonio, bioscience is one of four key sectors for which commercialization support is provided to start-ups by the **San Antonio Technology Accelerator Initiative**.

## Making Capital Available

### Pre-seed and seed capital

Pre-seed investments in bioscience start-ups are considered by

- Members of the **Houston Angel Network**; and
- **STARTech Early Ventures**, a fund in the Dallas/Fort Worth region created by Texas Instruments (TI) alumni.

An \$8 million **WesTech Ventures Fund**, operated by Emergent Technologies of Houston, targets seed-stage investments in West Texas and has launched four bioscience start-ups from the Texas Tech University System, based in Lubbock.

Bioscience companies are eligible for seed-stage investment by the **Product Development Fund** and **Small Business Incubator Fund** setup with \$45 million in bond funding in the Comptroller's Office.

**Tech Fort Worth** offers \$3,000 in support for preparation of Small Business Innovation Research Phase I proposals.

## Venture capital

Venture partnerships certified by the **Texas Certified Capital Companies Program** have not yet been announced.

The University of Texas Investment Management Company, or UTIMCO, the captive investment manager for the Permanent University fund serving the UT system, has agreed to invest some of its venture-capital allocation in partnerships that target investments in firms spun off from the UT system.

## Providing Space for Bioscience Companies

### Incubators

Bioscience incubators include the following:

- **North Texas Enterprise Center for Medical Technology**, a joint venture of Hall Ventures and City of Frisco, with 11,000 square feet of dry laboratories
- **TEKSA Innovations Corp.**, a for-profit incubator that provides access to molecular and cell-culture laboratories in the INCELL building at Texas Research Park in San Antonio
- **Tech Fort Worth** (formerly Fort Worth MedTech Center), a 15,000-square-foot incubator situated in the biotechnology building at University of North Texas in Fort Worth.

Creation of additional incubators will be supported through the ETF Commercialization grant.

### Bioscience research parks

The best developed bioscience research park is the **Texas Research Park** of West San Antonio. This 1,236-acre facility is being developed by a nonprofit foundation. It is anchored by the Institute for Biotechnology of the UT Health Science Center at San Antonio and hosts a variety of tenants including contract biomanufacturing firms and the TEKSA incubator (see above). Also well established, but only recently developing a bioscience orientation, is the **Texas A&M University Research Park** in College Station. The second phase is now complete with tenants occupying 310,000 square feet over six buildings.

#### ***Under development***

**UT Research Park**, on 100 acres close by the multi-institutional Texas Medical Center, is being developed as a partnership of the UT MD Anderson Center and the UT Houston Health Science Center. The initial buildings are primarily clinical uses, but commercial partners are being sought.

**Temple Life Science Research and Technology Campus** is anchored by a former TI facility on a hospital and research complex set on 503 acres an hour north of Austin.

A Biotechnology Corridor is offering up to 400,000 square feet in wet-lab space adjacent to UT Southwestern Medical Center in a multi-institutional medical district in Dallas.

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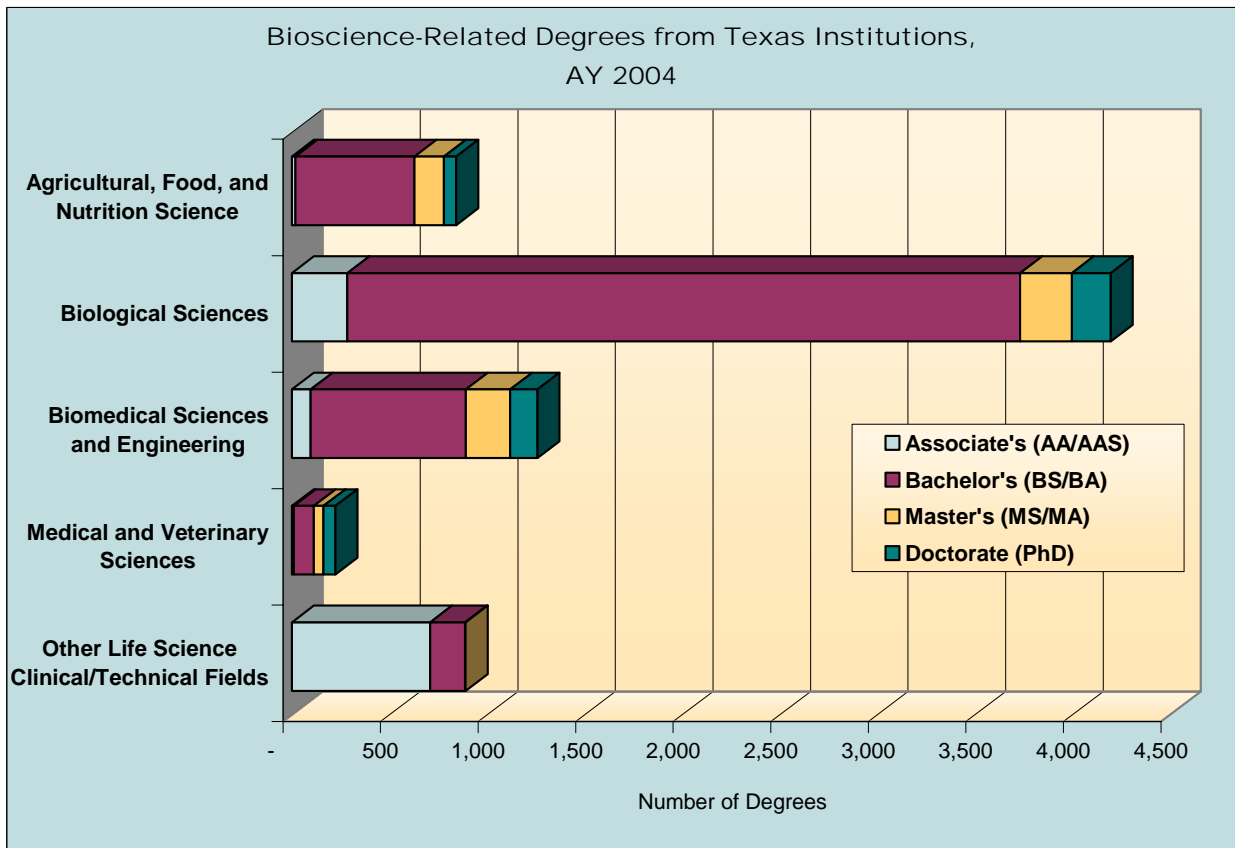
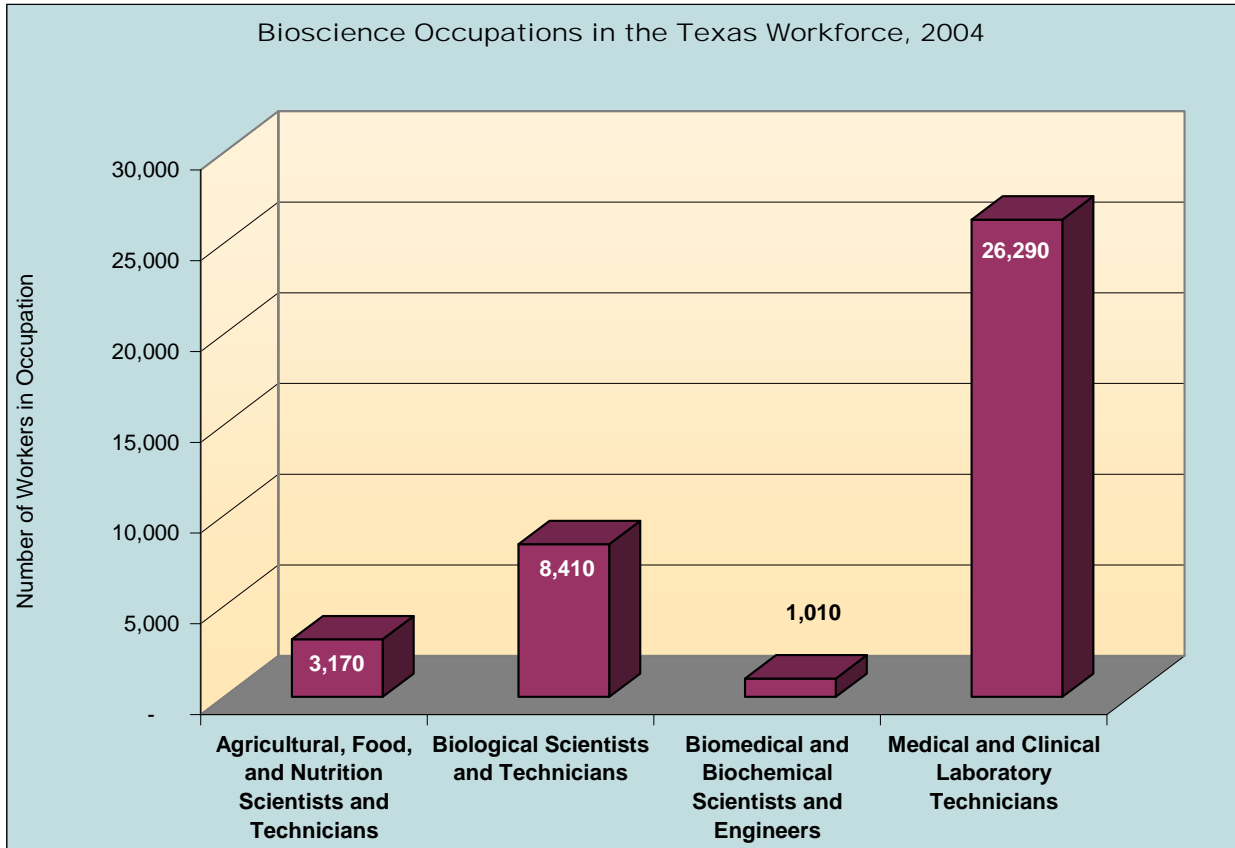
The Texas Healthcare and Bioscience Institute is composed of biotechnology, medical device, and pharmaceutical companies; universities and private research institutions; and companies that provide goods and services to core organizations. The mission of THBI is to research, develop, and advocate policies and actions that promote biomedical science, biotechnology, agriculture, and medical device innovation in Texas.

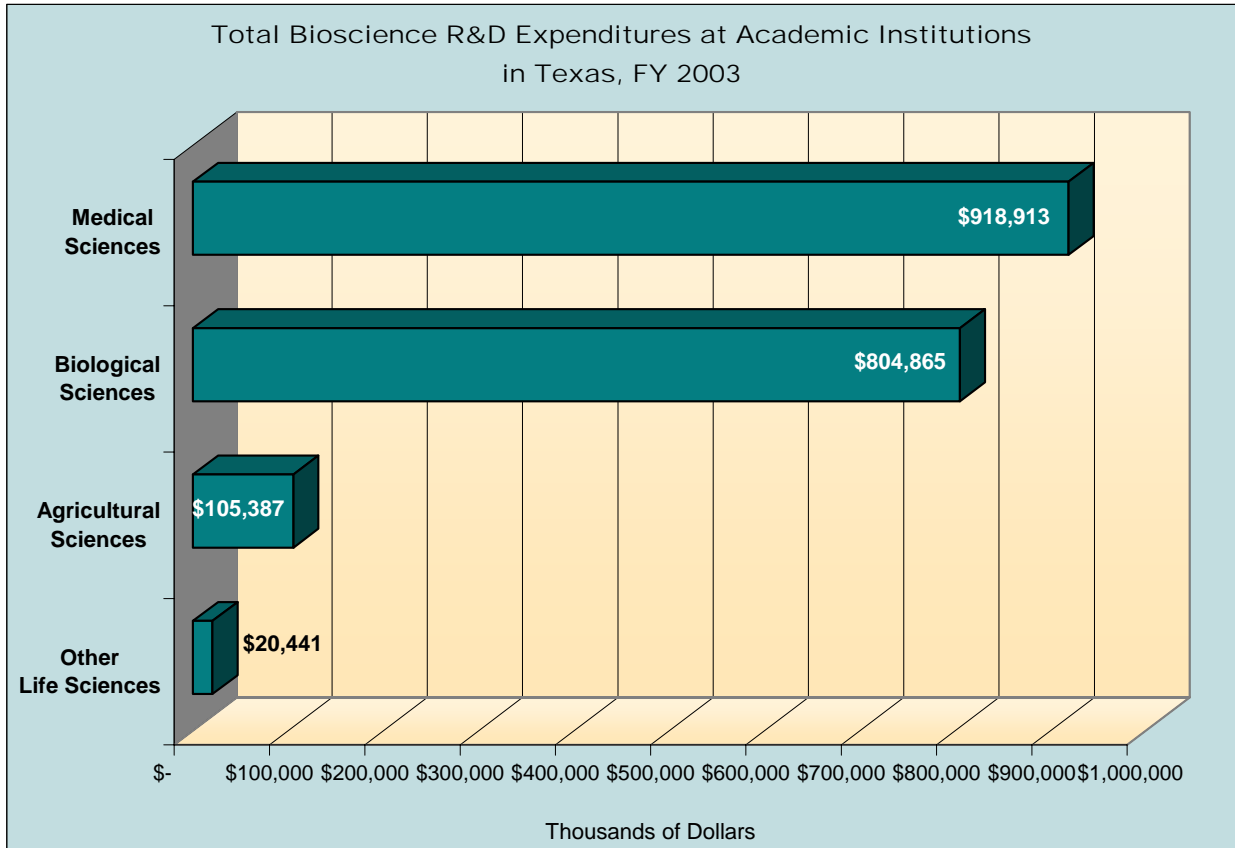
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Industry Subsector	Texas	United States
<b>Agricultural Feedstock &amp; Chemicals</b>		
Establishments 2004	222	2,111
2001-2004 Establishment % Change	7.5%	0.4%
Employment 2004	11,082	104,893
2001-2004 Employment % Change	-22.7%	-6.9%
Share of U.S. Employment	10.6%	100.0%
Location Quotient	1.50	n.a.
Average Annual Wage 2004	\$76,298	\$63,383
Direct-Effect Employment Multiplier	8.15	10.91
Total Employment Impact	90,352	1,212,094
<b>Drugs &amp; Pharmaceuticals</b>		
Establishments 2004	142	2,589
2001-2004 Establishment % Change	6.0%	-0.6%
Employment 2004	9,238	313,207
2001-2004 Employment % Change	3.1%	2.7%
Share of U.S. Employment	2.9%	100.0%
Location Quotient	0.42	n.a.
Average Annual Wage 2004	\$68,762	\$79,303
Direct-Effect Employment Multiplier	4.98	9.51
Total Employment Impact	46,047	2,731,321
<b>Medical Devices &amp; Equipment</b>		
Establishments 2004	763	15,190
2001-2004 Establishment % Change	-12.2%	0.2%
Employment 2004	16,334	411,460
2001-2004 Employment % Change	-8.7%	-3.6%
Share of U.S. Employment	4.0%	100.0%
Location Quotient	0.56	n.a.
Average Annual Wage 2004	\$47,724	\$56,449
Direct-Effect Employment Multiplier	3.24	4.56
Total Employment Impact	52,937	1,817,705
<b>Research, Testing, &amp; Medical Laboratories</b>		
Establishments 2004	1,240	20,565
2001-2004 Establishment % Change	29.3%	19.4%
Employment 2004	19,130	413,550
2001-2004 Employment % Change	10.5%	8.2%
Share of U.S. Employment	4.6%	100.0%
Location Quotient	0.66	n.a.
Average Annual Wage 2004	\$52,501	\$65,414
Direct-Effect Employment Multiplier	2.48	3.15
Total Employment Impact	47,366	1,272,936
<b>TOTAL PRIVATE SECTOR</b>		
Establishments 2004	497,393	8,156,137
2001-2004 Establishment % Change	3.7%	4.8%
Employment 2004	7,694,668	109,249,195
2001-2004 Employment % Change	-1.2%	-0.7%
Share of U.S. Employment	7.0%	100.0%
Location Quotient	n.a.	n.a.
Average Annual Wage 2004	\$39,109	\$39,003

Source: Battelle calculations -- based on Bureau of Labor Statistics QCEW data from the Minnesota Implan Group, RIMS II Employment Multipliers from the Bureau of Economic Analysis, and the Census Bureau's Economic Census.

Note: n.a. = metric is not applicable.





	Texas	United States	Rank
<b>University R&amp;D Expenditures, FY 2003</b>			
Total (\$ thousands)	\$2,765,634	\$40,104,621	3
Life Science R&D (\$ thousands)	\$1,864,695	\$24,062,088	3
Percent of Total R&D	67.4%	60.0%	
Life Sciences Per Capita	\$84.30	\$82.74	
Change in Life Sciences FY 1999–2003	61.0%	52.7%	
<b>NIH Support to Institutions, FY 2004</b>			
Total (\$ thousands)	\$1,147,993	\$22,556,459	6
Per Capita Expenditures	\$51.90	\$77.56	
Change in Expenditures FY 2000–2004	50.0%	53.2%	
<b>Higher Education Degrees in Bioscience Fields, AY 2004</b>			
	7,414	111,329	2
<b>Bioscience Occupations in the Workforce, 2004</b>			
	38,880	616,140	2