Technology Development and Transfer
FY 2003 and FY 2004

Texas Higher Education Coordinating Board
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COORDINATING BOARD MISSION

The mission of the Texas Higher Education Coordinating Board is to provide the Legislature advice and comprehensive planning capability for higher education, to coordinate the effective delivery of higher education, to administer programs efficiently and to improve higher education for the people of Texas.

COORDINATING BOARD PHILOSOPHY

The Texas Higher Education Coordinating Board will promote access to quality higher education across the state with the conviction that access without quality is mediocrity and that quality without access is unacceptable. The Board will be open, ethical, responsive, and committed to public service. The Board will approach its work with a sense of purpose and responsibility to the people of Texas and is committed to the best use of public monies.

Created by the Texas Legislature in 1965, the Texas Higher Education Coordinating Board works with institutions of higher education, other state agencies, the Legislature and the Governor to ensure that Texans seeking higher education have access to high quality programs. The Board’s overall responsibilities include assessing the state of higher education in Texas, making recommendations to the Governor, Legislature and institutions for its enhancement, and establishing policies for the efficient and effective use of the state’s higher education resources.

Executive Summary

This report, required by Texas Education Code, Section 153.008 (SB 1190 of the 77th Legislature), is a compilation of data provided by each Texas public university and health-related institution for Fiscal Years 2003 and 2004. Highlights include:

- Revenue received from intellectual property grew from $33,569,444 in Fiscal Year 2003 to $38,315,106 in Fiscal Year 2004, a 14.1 percent increase.

- Total direct expenses for technology transfer activities increased from $15,948,597 in Fiscal Year 2003 to $16,711,142 in Fiscal Year 2004. For both years, the single largest expense category was legal expenses (about half of all expenses), including patent prosecution costs.

- In Fiscal Year 2003, 113 employees were engaged in technology transfer activities at Texas public universities and health-related institutions across the state. In Fiscal Year 2004, the number of technology transfer employees dropped to 108.

- In Fiscal Year 2003, Texas public universities and health-related institutions received 746 invention disclosures and 154 U.S. patents, executed 97 exclusive and 138 non-exclusive licensing agreements, and formed 16 start-up companies. In Fiscal Year 2004, Texas public universities and health-related institutions received 720 invention disclosures and 161 U.S. patents, executed 119 exclusive and 102 non-exclusive licensing agreements, and formed 14 start-up companies.

- In Fiscal Year 2003, the top five entities signing exclusive licensing agreements were The University of Texas Southwestern Medical Center at Dallas, Texas Agricultural Experiment Station, The University of Texas at Austin, Texas Engineering Experiment Station, and The University of Texas M.D. Anderson Cancer Center. Texas Agricultural Experiment Station executed 37 and The University of Texas Health Science Center-Houston and The University of Texas Health Science Center-San Antonio each executed 20 non-exclusive licensing agreements in Fiscal Year 2003. In Fiscal Year 2004, the top five entities signing exclusive licensing agreements were The University of Texas M. D. Anderson Cancer Center, Texas Agricultural Experiment Station, The University of Texas Southwestern Medical Center at Dallas, Texas Engineering Experiment Station, and The University of Texas at Austin. Both The University of Texas Health Science Center at Houston and The University of Texas Southwestern Medical Center at Dallas executed 20 non-exclusive licensing agreements in Fiscal Year 2004.

- The University of Texas M.D. Anderson Cancer Center holds the largest number of shares of publicly traded stock through intellectual property agreements.

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Introduction

Through SB 1190 (TEC 153.008), the 77th Legislature authorized the establishment of Centers for Technology Development and Transfer at public higher education institutions to enhance the economic growth and diversification of the state. The legislation also charged the Coordinating Board with reporting technology transfer activities at public higher education institutions. This is the second biennial technology transfer report to meet that requirement. It compiles data submitted by Texas public higher education institutions. The survey form is included in Appendix A. Contact information for the individuals who submitted the information is included in Appendix B.

Intellectual Property Protection

Texas public universities and health-related institutions use a variety of methods, shown in Tables 1 and 2, to document and protect intellectual property and initiate transfer of new knowledge to the marketplace. Because protecting intellectual property usually involves a multi-year effort, patents granted during one fiscal year arise from patent filings and invention discoveries made in previous fiscal years. The period of time required to move an idea from inception to commercial product varies considerably.

Investigators at higher education institutions file invention disclosure forms with their institutions to initiate the process of protecting discoveries made while conducting research. Institutional review of these disclosures determines which inventions the institution will use its resources to protect and commercialize. The institutions typically apply for patents from the U.S. Patent and Trademark Office to legally grant them property rights that exclude others from making, using, or selling the intellectual property. Further development and commercialization of intellectual property is frequently accomplished through licensing agreements between private companies and higher education institutions. In exchange for cash or other negotiated considerations, an institution will grant an exclusive license allowing only one company to use the intellectual property or a non-exclusive license that allows others to also use it. Institutions may protect new plant varieties or cultivars by applying for certificates granted by the United States Department of Agriculture under the Plant Variety Protection Act.

For FY 2003, Texas public higher education institutions received 746 invention disclosures, while for FY 2004 they received 720. In FY 2003, they filed 526 patent applications, received 154, and executed 97 and 138 exclusive and non-exclusive licensing agreements, respectively. In FY 2004, 443 patent applications were filed and 161 patents were received, while the numbers of exclusive and non-exclusive licensing agreements executed totaled 119 and 102 (Tables 1 and 2).

The University of Texas M. D. Anderson Cancer Center reported the largest number of invention disclosures for both fiscal years. The University of Texas at Austin and The University of Texas Southwestern Medical Center at Dallas each were granted more than 30 patents in FY 2004. Fourteen institutions filed 10 or more patent applications in FY 2003. The Texas Agricultural Experiment Station reported the largest number of licensing agreements for both years (tied with The University of Texas Southwestern Medical Center at Dallas in FY 2004).
Two institutions pursued Plant Variety Protection Act certificates: Texas Agricultural Experiment Station and Texas Tech University.

Eleven copyright registrations were reported for commercial products in FY 2003 and 12 were reported in FY 2004. In FY 2003, all public health-related institutions, 17 public universities, and four Texas A&M service agencies reported activities related to intellectual property protection (Table 1).

R. Page Heller of the Texas A&M University Licensing Office states "Within the last decade, universities in Texas have found a way to deliver technology from the lab bench to the public through the commercialization efforts of their technology transfer offices. As the increasing numbers in this report demonstrate, programs of licensing and development are enhancing the ability of the State of Texas to turn research into reality."

Table 1

Activities to Protect and Commercialize New Intellectual Properties, FY 2003

Institution	Number of new: Invention Disclosures Received	U.S. Patent Applications: Filed	U.S. Patent Applications: Granted	PVPA* Applications Filed through USDA	Licensing Agreements Executed: Exclusive	Licensing Agreements Executed: Non-exclusive	U.S. Copyright Registrations for Commercial Products	Start-Up Companies Formed**
Stephen F. Austin State	0	0	0	0	1	0	0	0
Texas A&M University System								
Prairie View A&M	1	2	0	0	0	0	0	0
Tarleton State	1	0	0	0	0	0	0	0
Texas A&M	16	18	4	0	7	1	0	0
Texas A&M at Galveston	1	2	0	0	0	0	0	0
Texas A&M-Kingsville	0	1	0	0	0	0	0	0
Texas Ag. Experiment Station	19	19	6	2	16	37	0	0
Texas Cooperative Ext.	2	0	0	0	0	0	0	0
Texas Eng. Experiment Station	52	50	21	0	9	1	1	0
Texas Transportation Institute	14	8	2	0	4	0	0	0
Texas A&M HSC	11	13	1	0	1	0	0	0
Texas State University System								
Southwest Texas State	2	1	0	0	0	0	0	0
Texas Tech University System								
Texas Tech	28	14	3	0	4	3	0	0
Texas Tech HSC	10	9	2	0	1	0	0	3
University of Texas System								
UT at Arlington	21	14	2	0	0	0	3	0
UT at Austin	69	51	28	0	10	10	2	6
UT at Dallas	33	10	6	0	2	0	1	0
UT at El Paso	10	3	0	0	0	0	4	0
UT-Pan American	0	0	0	0	0	1	0	0
UT at San Antonio	2	5	0	0	0	0	0	0
UT M.D. Anderson Cancer	126	96	19	0	9	15	0	3
UTMB at Galveston	48	41	4	0	7	12	0	1
UTHSC at Houston	67	20	12	0	2	20	0	1
UT Health Center at Tyler	3	3	0	0	1	0	0	0
UTHSC at San Antonio	43	37	9	0	4	20	0	0
UT Southwestern Medical Center	103	78	19	0	18	15	0	1
University of Houston System								
Univ. of Houston	52	12	13	0	0	2	0	0
Univ. of Houston-Victoria	1	1	0	0	0	0	0	0
University of North Texas System								
Univ. of North Texas	7	9	0	0	0	0	0	0
Univ. of North Texas HSC	4	9	3	0	1	1	0	1
Totals	**746**	**526**	**154**	**2**	**97**	**138**	**11**	**16**

*Plant Variety Protection Act

**Corporations, partnerships and other business entities formed to commercialize intellectual property owned by institution.

Table 2

Activities to Protect and Commercialize New Intellectual Properties, FY 2004

Institution	Number of new: Invention Disclosures Received	U.S. Patent Applications: Filed	U.S. Patent Applications: Granted	PVPA* Applications Filed through USDA	PVPA* Certificates Granted	Licensing Agreements Executed: Exclusive	Licensing Agreements Executed: Non-exclusive	U.S. Copyright Registrations for Commercial Products	Start-Up Companies Formed**
Stephen F. Austin State	1	0	0	0	0	1	0	0	1
Texas A&M University System									
Prairie View A&M	1	3	0	0	0	3	0	0	0
Texas A&M	22	16	3	0	0	6	1	0	0
Texas A&M at Galveston	0	1	0	0	0	0	0	0	0
Texas A&M International	0	0	0	0	0	0	0	0	0
Texas A&M-Kingsville	1	2	0	0	0	0	0	0	0
Texas Ag. Experiment Station	24	13	4	2	11	16	18	0	0
Texas Cooperative Ext.	0	0	0	0	0	0	0	0	0
Texas Eng. Experiment Station	50	29	18	0	0	13	1	3	0
Texas Transportation Institute	12	7	2	0	0	4	1	0	0
Texas A&M HSC	10	17	5	0	0	2	1	0	0
Texas State University System									
Lamar	2	0	0	0	0	0	0	0	0
Sam Houston State	1	0	0	0	0	0	0	0	0
Texas State Univ. - San Marcos	3	2	0	0	0	1	1	0	0
Texas Tech University System									
Texas Tech	25	8	3	1	0	2	1	0	0
Texas Tech HSC	18	2	0	0	0	3	1	0	0
University of Texas System									
UT at Arlington	17	7	2	0	0	0	0	1	2
UT at Austin	87	71	32	0	0	11	12	0	6
UT at Dallas	26	6	5	0	0	2	0	2	0
UT at El Paso	11	6	0	0	0	1	0	0	0
UT-Pan American	3	1	0	0	0	0	1	0	0
UT at San Antonio	5	3	1	0	0	0	0	0	0
UT M.D. Anderson Cancer	115	46	19	0	0	26	7	3	2
UTMB at Galveston	63	35	6	0	0	6	9	0	1
UTHSC at Houston	43	20	12	0	0	2	20	0	0
UT Health Center at Tyler	1	1	0	0	0	0	0	0	0
UTHSC at San Antonio	34	29	9	0	0	5	5	0	0
UT Southwestern Medical Center	89	57	34	0	0	14	20	0	1
University of Houston System									
Univ. of Houston	29	34	4	0	0	0	3	3	0
Univ. of Houston-Victoria	1	0	0	0	0	0	0	0	0
University of North Texas System									
Univ. of North Texas	16	18	0	0	0	1	0	0	1
Univ. of North Texas HSC	10	9	2	0	0	0	0	0	0
Totals	**720**	**443**	**161**	**3**	**11**	**119**	**102**	**12**	**14**

*Plant Variety Protection Act

**Corporations, partnerships and other business entities formed to commercialize intellectual property owned by institution.

Equity Interests

Seven health-related institutions, four universities, and the Texas A&M University System held equity interests under intellectual property agreements for FY 2003 and 2004, as indicated in Tables 3 and 4. The total number of shares of both publicly and non-publicly traded stock increased slightly over the biennium. The University of Texas Southwestern Medical Center at Dallas owns the largest number of shares in private stock while The University of Texas M.D. Anderson Cancer Center owns the largest number of shares in public stock. The fair market value of all holdings of public stock was about $10 million in FY 2004.

Table 3

Established and New Equity Interests Held by Institution Through Intellectual Property Agreements, FY 2003

Institution	Number of Enterprises		Number of Non-public Shares of Stock Held	Shares of Public Stock Held	
	Non-public	Public		Number	Fair Market Value
Texas A&M University System*	5	0	411,763	0	$0
University of Texas System					
UT at Austin	5	0	810,500	0	$0
UT at Dallas	2	0	***	0	$0
UT at El Paso	1	0	5,500	0	$0
UT M.D. Anderson Cancer	9	6	6,011,365	1,741,149	$8,373,800
UTMB at Galveston	4	0	1,676,184	0	$0
UTHSC at Houston	4	1	1,561,189	8,801	$52,973
UTHSC at San Antonio	7	0	3,296,138	0	$0
UT Southwestern Medical Center	10	2	8,030,854	224,048	$175,799
University of Houston System**	6	0	5,646,179	0	$0
University of North Texas System					
Univ. of North Texas HSC	4	0	1,322,414	0	$0
Totals	**57**	**9**	**28,772,086**	**1,973,998**	**$8,602,573**

*Reported by the System Administration for the Texas A&M University System.

**Reported by the System Administration for the University of Houston System.

***The equity in non-public enterprise(s) is not quantified as a number of shares.

Table 4

Established and New Equity Interests Held by Institution Through Intellectual Property Agreements, FY 2004

Institution	Number of Enterprises		Number of Non-public Shares of Stock Held	Shares of Public Stock Held	
	Non-public	Public		Number	Fair Market Value
Texas A&M University System*	6	0	441,763	0	$0
Texas Tech University System					
Texas Tech	2	0	***	0	$0
Texas Tech Univ. HSC	1	0	***	0	$0
University of Texas System					
UT at Austin	10	0	1,390,830	0	$0
UT at Dallas	2	0	***	0	$0
UT at El Paso	1	0	5,500	0	$0
UT M.D. Anderson Cancer	12	6	6,458,006	1,741,149	$8,093,031
UTMB at Galveston	4	1	1,676,184	183,747	$1,289,990
UTHSC at Houston	5	1	1,606,189	8,801	$77,009
UTHSC at San Antonio	8	0	3,296,498	0	$0
UT Southwestern Medical Center	8	2	7,892,468	75,276	$458,307
University of Houston System**	5	0	4,896,179	0	$0
University of North Texas System					
Univ. of North Texas HSC	4	2	1,252,500	88,982	$83,484
Totals	**68**	**12**	**28,916,117**	**2,097,955**	**$10,001,820**

*Reported by the System Administration for the Texas A&M University System.

**Reported by the System Administration for the University of Houston System.

***The equity in non-public enterprise(s) is not quantified as a number of shares.

Intellectual Property Income

Revenue received from intellectual property grew from $33,569,444 in FY 2003 to $38,315,106 in Fiscal Year 2004, a 14.1 percent increase (Tables 5 and 6). Seven institutions, including four health-related institutions, reported income greater than $1 million: The University of Texas Southwestern Medical Center ($12.2 million in FY 2004), The University of Texas M.D. Anderson

Table 5

Revenue Received from Intellectual Property Owned by Institution, FY 2003

	Type of Properties Producing Income and Revenue Received from:					
	Royalties and Fees		Reimbursed Patent Expenses	Cashed-in Equity	Other	
Institution	#	$	$	$	$	Total
Texas A&M University System						
Texas A&M	16	$109,900	$2,998	$0	$0	$112,898
Texas Ag. Experiment Station	154	$4,091,096	$111,637	$0	$0	$4,202,733
Texas Cooperative Ext.	3	$15,497	$8,505	$0	$0	$24,002
Texas Eng. Experiment Station	11	$333,427	$266,961	$0	$0	$600,388
Texas Transportation Institute	9	$3,582,263	$49,686	$0	$0	$3,631,949
Texas A&M HSC	1	$40,000	$2,802	$0	$0	$42,802
Texas Tech University System						
Texas Tech	4	$37,000	$19,000	$0	$0	$56,000
University of Texas System						
UT at Arlington	2	$35,606	$0	$0	$0	$35,606
UT at Austin	41	$3,814,833	$381,560	$104,772	$0	$4,301,165
UT at Brownsville	10	$4,323	$0	$0	$0	$4,323
UT at Dallas	6	$75,000	$74,093	$0	$0	$149,093
UT at El Paso	4	$10,201	$19,948	$0	$0	$30,150
UT-Pan American	1	$2,500	$0	$0	$0	$2,500
UT at San Antonio	0	$0	$0	$0	$45,198	$45,198
UT M.D. Anderson Cancer	35	$3,646,963	$792,897	$0	$0	$4,439,860
UTMB at Galveston	40	$294,000	$121,000	$0	$0	$415,000
UTHSC at Houston	18	$1,219,696	$262,497	$0	$0	$1,482,193
UT Health Center at Tyler	3	$15,000	$0	$0	$0	$15,000
UTHSC at San Antonio	56	$2,438,552	$62,105	$0	$0	$2,500,657
UT Southwestern Medical Center*	84	$10,850,387	$296,497	$62,316	$0	$11,209,200
University of Houston System						
Univ. of Houston	8	$252,354	$0	$0	$0	$252,354
University of North Texas System						
Univ. of North Texas	1	$4,277	$6,124	$0	$0	$10,401
Univ. of North Texas HSC	3	$5,973	$0	$0	$0	$5,973
Totals	**510**	**$30,878,848**	**$2,478,310**	**$167,088**	**$45,198**	**$33,569,444**

*For UT Southwestern Medical Center, the number of properties producing income for royalties and fees represents the total number of income-producing properties (includes properties from the reimbursed patent expenses and cashed-in equity columns).

Cancer Center ($6.1 million), The University of Texas at Austin ($5.4 million), the Texas Agricultural Experiment Station ($3.9 million), the Texas Transportation Institute ($3.0 million), the University of Texas Health Science Center at Houston ($2.6 million), and The University of Texas Health Science Center at San Antonio ($2.4 million). The Texas Transportation Institute continues to deploy a smaller number of properties producing a sizeable revenue stream as compared with other institutions. In FY 2004, royalties accounted for 91 percent and reimbursed patent expenses accounted for 8 percent of the total revenue for all the institutions.

Table 6

Revenue Received from Intellectual Property Owned by Institution, FY 2004

Institution	Type of Properties Producing Income and Revenue Received from:					
	Royalties and Fees		Reimbursed Patent Expenses	Cashed-in Equity	Other	Total
	#	$	$	$	$	
Stephen F. Austin State	1	$5,000	$0	$0	$0	$5,000
Texas A&M University System						
Prairie View A&M	3	$6,000	$0	$0	$0	$6,000
Texas A&M	9	$108,294	$10,816	$0	$0	$119,110
Texas Ag. Experiment Station	152	$3,811,511	$69,535	$0	$0	$3,881,046
Texas Cooperative Ext.	3	$37,352	$0	$0	$0	$37,352
Texas Eng. Experiment Station	18	$432,952	$316,422	$0	$0	$749,374
Texas Transportation Institute	8	$2,934,380	$94,653	$0	$0	$3,029,033
Texas A&M HSC	3	$0	$56,144	$0	$0	$56,144
Texas Tech University System						
Texas Tech	8	$144,866	$0	$0	$0	$144,866
Texas Tech HSC	2	$20,000	$0	$0	$0	$20,000
University of Texas System						
UT at Arlington	2	$48,871	$0	$0	$0	$48,871
UT at Austin	47	$5,057,647	$347,681	$0	$0	$5,405,328
UT at Brownsville	10	$4,885	$0	$0	$0	$4,885
UT at Dallas	11	$97,189	$13,715	$0	$0	$110,904
UT at El Paso	4	$16,633	$0	$0	$0	$16,633
UT-Pan American	1	$2,500	$0	$0	$0	$2,500
UT M.D. Anderson Cancer	49	$4,998,468	$963,306	$0	$100,072	$6,061,846
UTMB at Galveston	64	$217,000	$605,000	$0	$0	$822,000
UTHSC at Houston	31	$2,270,441	$292,094	$0	$1,446	$2,563,981
UT Health Center at Tyler	0	$0	$65,378	$0	$0	$65,378
UTHSC at San Antonio	65	$2,268,675	$135,532	$0	$0	$2,404,207
UT Southwestern Medical Center*	89	$11,810,443	$184,785	$171,111	$0	$12,166,339
University of Houston System						
Univ. of Houston	6	$534,053	$0	$0	$0	$534,053
University of North Texas System						
Univ. of North Texas	0	$0	$643	$0	$0	$643
Univ. of North Texas HSC	3	$59,614	$0	$0	$0	$59,614
Totals	**589**	**$34,886,774**	**$3,155,703**	**$171,111**	**$101,518**	**$38,315,106**

*For UT Southwestern Medical Center, the number of properties producing income for royalties and fees represents the total number of income-producing properties (includes properties from the reimbursed patent expenses and cashed-in equity columns).

Technology Transfer Expenses

Direct expenses related to intellectual property transfer are shown in Tables 7-12. Technology transfer offices are typically small operations considering the size of the institutions served. About 100 employees, primarily professional and support staff, are engaged in technology transfer activities at the public higher education institutions across the state. The single largest outlay is for legal expenses including patent prosecution costs. Although intellectual property income has been steadily growing, most technology transfer offices have been in place for a relatively short period of time and may continue to operate at a deficit. Most of the institutions that were successful at securing revenues in the millions of dollars had intellectual property revenues that exceeded direct expenditures (Tables 13 and 14).

Table 7

Total Expenditures for Activities Conducted Under Technology Transfer, FY 2003

Institution	Personnel	Facilities, Rent	Legal Expenses (Includes patent prosecution costs)	Operating Expenses	Travel	Equipment (Purchases in excess of $5,000) and Other	Total
Texas A&M University System*	$1,164,949	$68,400	$1,221,711	$124,307	$31,912	$0	$2,611,279
Texas State University System							
Sam Houston State	$11,314	$0	$0	$0	$0	$0	$11,314
Texas Tech University System							
Texas Tech	$70,782	$13,513	$108,009	$9,081	$4,174	$2,650	$208,209
Texas Tech HSC	$70,782	$13,513	$158,866	$9,081	$4,174	$2,650	$259,066
University of Texas System							
UT at Arlington	$58,488	$0	$115,752	$10,000	$2,781	$0	$187,020
UT at Austin	$613,861	$0	$611,329	$148,285	$23,797	$0	$1,397,272
UT at Dallas	$0	$0	$0	$0	$0	$0	$0
UT at El Paso	$107,556	$0	$88,032	$0	$2,731	$695	$199,014
UT at San Antonio	$0	$0	$66,887	$0	$0	$0	$66,887
UT M.D. Anderson Cancer	$1,526,136	$0	$2,791,274	$191,396	$20,669	$20,777	$4,550,252
UTMB at Galveston	$277,383	$0	$672,000	$44,871	$6,356	$0	$1,000,610
UTHSC at Houston	$274,766	$0	$375,735	$32,530	$3,562	$0	$686,593
UT Health Center at Tyler	$0	$0	$36,755	$0	$0	$0	$36,755
UTHSC at San Antonio	$566,643	$54,333	$587,120	$41,750	$2,495	$0	$1,252,341
UT Southwestern Medical Center	$1,315,944	$0	$1,154,003	$289,061	$72,579	$0	$2,831,587
University of Houston System**	$346,780	$0	$51,783	$169,650	$7,262	$0	$575,475
University of North Texas System							
Univ. of North Texas	$0	$0	$31,923	$0	$0	$0	$31,923
Univ. of North Texas HSC	$43,000	$0	$0	$0	$0	$0	$43,000
Totals	**$6,448,383**	**$149,759**	**$8,071,178**	**$1,070,012**	**$182,492**	**$26,772**	**$15,948,597**

*Reported by the System Administration for the Texas A&M University System.

**Reported by the System Administration for the University of Houston System.

Table 8

Total Expenditures for Activities Conducted Under Technology Transfer, FY 2004

Institution	Personnel	Facilities, Rent	Legal Expenses (Includes patent prosecution costs)	Operating Expenses	Travel	Equipment (Purchases in excess of $5,000) and Other	Total
Texas A&M University System*	$1,008,423	$52,400	$1,236,899	$103,835	$21,055	$0	$2,422,612
Texas State University System							
Sam Houston State	$11,487	$0	$0	$0	$0	$0	$11,487
Sul Ross State	$0	$0	$7,508	$0	$0	$0	$7,508
Texas Tech University System							
Texas Tech	$68,508	$11,717	$111,209	$6,803	$4,551	$0	$202,788
Texas Tech Univ HSC	$68,508	$11,717	$88,727	$6,803	$4,551	$0	$180,306
University of Texas System							
UT at Arlington	$69,889	$0	$138,066	$10,000	$4,108	$0	$222,063
UT at Austin	$686,472	$0	$1,059,716	$120,833	$17,160	$0	$1,884,181
UT at Dallas	$0	$0	$0	$0	$0	$0	$0
UT at El Paso	$107,556	$0	$84,185	$0	$3,609	$1,165	$196,515
UT-Pan American	$1,200	$0	$5,600	$0	$0	$0	$6,800
UT at San Antonio	$14,500	$0	$72,922	$0	$729	$0	$88,151
UT M.D. Anderson Cancer	$1,568,953	$0	$3,075,190	$0	$35,870	$7,009	$4,687,022
UTMB at Galveston	$576,000	$0	$933,000	$56,571	$6,446	$0	$1,572,017
UTHSC at Houston	$287,417	$0	$374,291	$28,602	$893	$0	$691,203
UT Health Center at Tyler	$0	$0	$45,179	$0	$0	$0	$45,179
UTHSC at San Antonio	$367,161	$31,980	$623,550	$49,759	$3,343	$0	$1,075,793
UT Southwestern Medical Center	$1,196,953	$0	$892,987	$263,809	$34,626	$0	$2,388,375
University of Houston System**	$288,310	$0	$55,452	$252,840	$5,686	$0	$602,288
University of North Texas System							
Univ. of North Texas	$151,000	$0	$58,287	$0	$4,289	$18,607	$232,183
Univ. of North Texas HSC	$95,002	$0	$38,547	$56,430	$4,691	$0	$194,670
Totals	**$6,567,340**	**$107,814**	**$8,901,315**	**$956,285**	**$151,607**	**$26,781**	**$16,711,142**

*Reported by the System Administration for the Texas A&M University System.

**Reported by the System Administration for the University of Houston System.

Table 9

Net Income for Activities Conducted Under Technology Transfer, FY 2003

Institution	Total Expenses for Technology Transfer	Revenue Received from Intellectual Properties	Net Income (Revenue Received - Total Expenses)
Texas A&M University System*	$2,611,279	$8,614,772	$6,003,493
Texas State University System			
Sam Houston State	$11,314	$0	($11,314)
Texas Tech University System			
Texas Tech	$208,209	$56,000	($152,209)
Texas Tech HSC	$259,066	$0	($259,066)
University of Texas System			
UT at Arlington	$187,020	$35,606	($151,414)
UT at Austin	$1,397,272	$4,301,165	$2,903,893
UT at Dallas	$0	$149,093	$149,093
UT at El Paso	$199,014	$30,150	($168,864)
UT-Pan American	$0	$2,500	$2,500
UT at San Antonio	$66,887	$45,198	($21,689)
UT M.D. Anderson Cancer	$4,550,252	$4,439,860	($110,392)
UTMB at Galveston	$1,000,610	$415,000	($585,610)
UTHSC at Houston	$686,593	$1,482,193	$795,600
UT Health Center at Tyler	$36,755	$15,000	($21,755)
UTHSC at San Antonio	$1,252,341	$2,500,657	$1,248,316
UT Southwestern Medical Center	$2,831,587	$11,209,200	$8,377,613
University of Houston System**	$575,475	$252,354	($323,121)
University of North Texas System			
Univ. of North Texas	$31,923	*$10,401*	($21,522)
Univ. of North Texas HSC	$43,000	$5,973	($37,027)
Totals	**$15,948,597**	**$33,565,121**	**$17,616,525**

*Reported by the System Administration for the Texas A&M University System.

**Reported by the System Administration for the University of Houston System.

Table 10

Net Income for Activities Conducted Under Technology Transfer, FY 2004

Institution	Total Expenses for Technology Transfer	Revenue Received from Intellectual Properties	Net Income (Revenue Received - Total Expenses)
Stephen F. Austin State	$0	$5,000	$5,000
Texas A&M University System*	$2,422,612	$7,878,059	$5,455,447
Texas State University System			
Sam Houston State	$11,487	$0	($11,487)
Sul Ross State	*$7,508*	*$0*	($7,508)
Texas Tech University System			
Texas Tech	$202,788	$144,866	($57,922)
Texas Tech HSC	$180,306	$20,000	($160,306)
University of Texas System			
UT at Arlington	$222,063	$48,871	($173,192)
UT at Austin	$1,884,181	$5,405,328	$3,521,147
UT at Dallas	$0	$110,904	$110,904
UT at El Paso	$196,515	$16,633	($179,882)
UT-Pan American	$6,800	$2,500	($4,300)
UT at San Antonio	$88,151	$0	($88,151)
UT M.D. Anderson Cancer	$4,687,022	$6,061,846	$1,374,824
UTMB at Galveston	$1,572,017	$822,000	($750,017)
UTHSC at Houston	$691,203	$2,563,981	$1,872,778
UT Health Center at Tyler	$45,179	$65,378	$20,199
UTHSC at San Antonio	$1,075,793	$2,404,207	$1,328,414
UT Southwestern Medical Center	$2,388,375	$12,166,339	$9,777,964
University of Houston System**	*$602,288*	*$534,053*	($68,235)
University of North Texas System			
Univ. of North Texas	*$232,183*	*$643*	($231,540)
Univ. of North Texas HSC	*$194,670*	*$59,614*	($135,056)
Totals	**$16,711,142**	**$38,310,222**	**$21,599,080**

*Reported by the System Administration for the Texas A&M University System.

**Reported by the System Administration for the University of Houston System.

Technology Transfer Highlights

Institutions reported the following highlights of technology transfer activities for FY 2003 and FY 2004.

- "TheraSense Inc. started from technology invented by Dr. Adam Heller of The University of Texas at Austin. He developed a system that enabled people with diabetes to test their blood glucose levels with tiny blood samples and get faster results than other methods. A small sample size can be tested in seven seconds. In 2000, Heller and his son Ephraim formed TheraSense. In April 2004, Abbott Laboratories bought TheraSense for $1.2 billion." http://www.therasense.com/

- "Reducing dependence on foreign oil and saving consumers money are just two advantages of the new StarRotor engine being developed by Texas A&M University chemical engineering professor Dr. Mark Holtzapple. Holtzapple's StarRotor engine captures the heat given off in car exhaust and uses it to power the car. Typical car engines are inefficient and lose energy when hot exhaust gases are released into the air. In contrast, the StarRotor engine is much more efficient, and its exhaust is much cooler. Intended to have a one million-mile life, the engine will be designed to run on a variety of fuels including gas, diesel, jet fuel, kerosene, natural gas, alcohol and olive oil and can switch fuel types while running. It will emit almost no pollution. More than 35 technologies developed at the Texas A&M University System comprise the portfolio of technologies licensed to StarRotor through four license agreements." http://www.starrotor.com

- "Respironics continued to contribute a major share of licensing revenue to The University of Texas at Arlington (UTA) during FY 2003 and FY 2004. Dr. Khosrow Behbehani, Professor of Biomedical Engineering, with other UTA researchers and area doctors invented "Method and Apparatus for Controlling Sleep Disorder Breathing." UTA patented and licensed the technology to Respironics which uses the technology in a device to control sleep apnea. Dr. Behbehani and his colleagues are developing advanced technology in this field. New patents have been filed that advance diagnosis and treatment of sleep apnea. These patents present an opportunity to start a new company or continue commercialization through licensing."

- "The University of Texas M.D. Anderson Cancer Center: IDev Technologies, Inc. was created in FY 2000 and has raised approximately $5 million to date. IDev has received FDA approval on two products and both are sold in the US and internationally. IDev Technologies, Inc. is an innovator and developer of next generation medical devices for use in the interventional radiology and cardiology device marketplace. 'Hepsera,' which is used for the treatment of Hepatitis B Virus infections, received FDA approval in September, 2002." http://www.idevtechnologies.com/

- "Since the mid-1980s, Dr. Robert Pearlman, a pharmacy professor at The University of Texas at Austin, has been a pioneer in developing computer-assisted drug discovery software. Drug companies throughout the world use versions of Pearlman's programs. The software assists scientists by enabling computer-based predictions of how well a small molecule might interact with a given biomolecular target even before that small molecule has been synthesized. In 2003, after years of licensing the software through another company, Pearlman and business executive Jerry Koontz started Optive Research Inc. to further develop and commercialize his software discoveries. The company is now a thriving venture based in Austin, selling its products in the United

States and throughout the world. Royalties on the sales flow through to the university." http://www.optive.com/

- "More than 120,000 installations of the ET-2000 Guardrail End Treatment, developed at the Texas Transportation Institute, have been made on the nation's roadways. The device slows an errant vehicle to a safe and stable stop when the guardrail is hit head-on. The in-service safety record of the ET-2000 has proven it to be a tremendous public benefit in saving lives along the nation's highways. More than 14 technologies, including the ET 2000, developed at the A&M System comprise the portfolio of technologies licensed to Trinity Industries, Inc., headquartered in Dallas, through fourteen different license agreements." http://www.highwayguardrail.com

- "According to industry sources, approximately 15.5 trillion cubic feet of stranded natural gas is flared, vented, or re-injected each year. Approximately 1.5 billion barrels of fuel per year (4.1 million barrels per day) could be produced if this gas were converted into synthesized fuels. The challenge then becomes obvious: to develop a gas-to-liquid system that can economically access and process this abundant supply of stranded natural gas. Synfuels International provides a solution. On August 21, 1998, Conquest Resources Corporation, the wholly owned subsidiary of Synfuels International, Inc., entered into an agreement with Texas A&M University to implement important research and development of a unique technology that converts natural gas into a variety of liquid hydrocarbon fuels (gas-to-liquids or "GTL"), in order to monetize abundant global remote and stranded natural gas reserves. In May, 1999, Synfuels International was formed as a Texas corporation for the purpose of developing and implementing the GTL technology on an international basis. During the past six years, Synfuels has made significant progress, proving the Synfuels process works with the production of 95 octane fuel from natural gas in a pilot demonstration plant. During the last 2 years Synfuels has continued to grow and to develop new technologies. A demonstration unit has been completed in Bryan, Texas, and is now operating." http://www.synfuels.com/

- "Texas Agricultural Experiment Station: The 'Texas 1015' onion, has had a $1.2 billion economic impact since its release in 1983. The 1015 was one of the first sweet, mild onions in the market, creating a whole new niche in the industry and commanding important premiums even today. Dr. Leonard M. Pike, Professor of Department of Horticultural Sciences and Director of the Vegetable and Fruit Improvement Center at Texas A&M University, was chosen to receive a Spirit of Innovation Award for 'Economic Impact.' The 'Texas 1015 Onion,' other onion varieties, carrots (including the BetaSweet maroon carrot), and many other improved vegetable varieties have been licensed to growers and seed companies across the state and around the world. The improved varieties have resulted in economic impact of millions of dollars for the Texas agricultural industry, especially in the Rio Grande Valley."

- "Molecular Imprints Inc. is a rare thing: a company selling products based on nanotechnology. The company's machines imprint semiconductors using a 'step-and-flash' photolithography process based on technology developed at The University of Texas at Austin by engineering professors Grant Willson and S.V. Sreenivasan. The result is a lower cost and faster process for semiconductor makers. Molecular Imprints, based in Austin, has raised $60 million in venture capital and is establishing offices throughout the world." http://www.molecularimprints.com/

- "Texas Engineering Experiment Station: The A&M System holds both a royalty position and an equity position in the company NxtPhase. The intellectual property licensed to NxtPhase comprises methods and apparatus using interferometers to measure currents and voltages and to act as a medium for communications. The work was developed in two parts; one part with funding made available through the Texas A&M University System, and one part with funding made available through the Center for Electronic Materials, Devices and Systems. The A&M System intellectual property is still considered one of the most valuable properties NxtPhase holds. The A&M System inventor is Dr. Jim Blake, formerly of the TEES Electrical Engineering Division, now employed with NxtPhase." http://www.nxtphase.com

- "Texas Agricultural Experiment Station: Bacculovirus Expression Vector System (BEVS) has become a mainstream tool for the production of proteins in cultured insect cells and live insects. BEVS was developed in the laboratory of Dr. Max Summers, and has been licensed non-exclusively to more than 99 companies in over 35 countries around the world to develop therapies for a variety of illnesses." http://www.tamu.edu/summerslab/baculovirus.html

- "The University of Texas at Arlington: Resonant Optics, Inc. (optical technology invented by Dr. Robert Magnusson) and Vapro Technology, L.L.C. (boiling enhancement heat transfer technology invented by Dr. S. M. You) are both working through the Arlington Technology Incubator."

Acknowledgement

The Coordinating Board wishes to thank the institutions and their representatives for suggestions regarding the survey format. Terry Young, former Executive Director of the Technology Licensing Office at the Texas A&M University System, was especially helpful in providing extended assistance and advice.

Appendix A – Survey

Technology Development and Transfer Survey
Fiscal Years 2003 and 2004

Completion of this biennial survey will satisfy reporting requirements under Chapter 153.008 (Texas Education Code). Any questions regarding the survey should be directed to Linda Domelsmith (512-427-6150; Linda.Domelsmith@thecb.state.tx.us). Please mail or fax the completed survey to Linda Domelsmith, Director of Research Programs, Texas Higher Education Coordinating Board, P.O. Box 12788, Austin, TX 78711 (Fax: 512-427-6147)

Deadline: Friday, October 15, 2004

Contact Information

Institution Name	
Contact Person's Name	
Title	
Department or Office	
Address	
Phone Number	
Fax Number	
E-Mail Address	

Section I: Activities to Protect and Commercialize New Intellectual Properties

	FY 2003	FY 2004
Number of new invention disclosures received		
Number of new invention disclosures granted		
Number of new U.S. patent applications filed (including provisionals, divisionals, and continuations in part)		
Number of new U.S. patent applications granted		
Number of new Plant Variety Protection Act (PVPA) applications filed through USDA		
Number of new PVPA certificates granted		
Number of new licensing agreements executed: Exclusive		
Non-exclusive		
Number of new U.S. copyright registrations for commercial products		
Number of new corporations, partnerships, and other business entities established to commercialize intellectual property owned by your institution		

Section II: Established and New Equity Interests Held by Your Institution under Intellectual Property Agreements

	FY 2003		FY 2004	
Publicly-traded enterprises (list separately; attach additional page(s) if necessary)	Number of shares of stock held at end of FY 2003	Fair Market Value at End of FY 2003	Number of shares of stock held at end of FY 2004	Fair Market Value at End of FY 2004
Total for publicly-traded enterprises				
Nonpublicly-traded enterprises (list separately; attach additional page(s) if necessary)	Number of shares of stock held at end of FY 2003		Number of shares of stock held at end of FY 2004	
Total for nonpublicly-traded enterprises				

Section III: Revenues Received from Intellectual Property Owned by Your Institution

	FY 2003		FY 2004	
	Number of Properties Producing Income in FY 2003	Revenue Received in FY 2003	Number of Properties Producing Income in FY 2004	Revenue Received in FY 2004
Royalties and fees				
Reimbursed patent expenses				
Cashed-in equity				
Other				
Total				

Section IV: Direct Expenditures for Activities Conducted Under Technology Transfer

	FY 2003		FY 2004	
	Number of Employees at end of FY 2003	Expenses for FY 2003	Number of Employees at end of FY 2004	Expenses for FY 2004
Personnel				
Executive/Managerial				
Professional Staff				
Support Staff				
Students				
Facilities, Rent				
Legal Expenses (including patent prosecution costs)				
Equipment (purchases in excess of $5,000)				
Operating Expenses				
Travel				
Other				
Total				

Section V: Commercial Successes

For possible inclusion in reports to the Legislature and other publications, please briefly describe up three of your most successful commercial accomplishments for FY 2003-2004.

Appendix B – Institutional Contacts

The following list contains the institutional representatives who submitted the data for this report. They may be contacted directly for additional information regarding research activities on individual campuses.

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Related reports available from the Texas Higher Education Coordinating Board, Division of Finance, Campus Planning, and Research:

Technology Development and Transfer, FY 2001-2002, November 2002

Research Experiences for High School Science and Math Teachers – Summer 2004, July 2004

Research Expenditures, September 1, 2002 – August 31, 2003, April 2004

Research Assessment Program – 2004 Final Report, October 2004

Technology Workforce Development Grants Program Annual Report, October 2004

Related information is also available at these websites:

http://www.thecb.state.tx.us/ResearchExpenditures/
http://www.thecb.state.tx.us/RestrictedResearch/
http://www.thecb.state.tx.us/research/
http://www.arpatp.com/
http://www.researchintexas.com/

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