

MICHIGAN

During the 6 years ending in 2006, employment in the research, testing, and medical laboratories subsector in Michigan grew faster than the national average. Growth in research funding from the National Institutes of Health also exceeded the national average over the past 6 years. Total academic bioscience research expenditures were \$910 million in 2006, mainly in medical and biological sciences. Michigan ranks eighth in the number of bioscience-related degrees produced in 2006. In the past 6 years, bioscience venture capital investments rose steadily to a peak of \$74 million in 2007, and a 6-year total of \$269 million. The largest share of venture capital investments was in pharmaceuticals, followed by human biotechnology. The 2,225 bioscience patents issued in State in the past 6 years were predominantly in drugs and pharmaceuticals, followed by surgical and medical instruments and biochemistry.

Major Industry Developments and Recent Successes

- **Caraco Pharmaceutical Laboratories**, a developer, manufacturer, and distributor of generic and private-label pharmaceuticals, announced in August 2007 that it would remain in Detroit and invest \$14.5 million in a 150,000-square-foot expansion, facilitated by State tax credits and city tax abatements.
- **HandyLab**, a developer of clinical diagnostics, announced in August 2007 that it would make a \$3 million investment in a manufacturing facility in Pittsfield Township, also facilitated by a State tax credit and township tax abatement.
- **Asterand**, a supplier of tissue samples for medical research that became the first bioscience tenant of Wayne State University's TechTown research park in Detroit, has grown to 100 employees; in 2007, its outgoing CEO Randal Charlton became entrepreneur-in-residence and special assistant to the president of Wayne State University. Asterand was previously an awardee of the predecessor program of the 21st Century Jobs Fund.

Recent State Initiatives

Life science programming through the Michigan Economic Development Corporation's (MEDC's) **21st Century Jobs Fund** increased from \$3.5 million in 2007 to \$18.2 million in 2008, targeted at a series of academic-industrial **Centers of Excellence**. Among the recent bioscience projects approved by MEDC was \$3.4 million to re-use a former Pfizer facility in Holland as a bioscience incubator/commercialization center.

Since the last BIO report, the \$109 million **21st Century Investment Fund** created as part of the 21st Century Jobs Fund joined the earlier \$95 million **Venture Michigan Fund** in making investments in venture-capital funds active in Michigan. In addition to functioning as a second fund of funds, the 21st Century Investment Fund may also make direct investments in venture-capital deals.

At an earlier stage of investment, the State's 12 "SmartZones"—tax-advantaged districts each equipped with university-affiliated incubation or commercialization programs—jointly launched a return-oriented **Michigan Pre-Seed Capital Fund**, which by March 2008 had invested \$5 million in 22 companies, many in the biosciences.

Michigan State University in Lansing was a collaborator with the University of Wisconsin in Madison in the **Great Lakes Bioenergy Research Center** awarded \$125 million by the U.S. Department of Energy in 2007. The Center also involves Pacific Northwest National Laboratory; Oak Ridge National Laboratory; and three universities in Florida, Illinois, and Iowa.

For additional information on Michigan's bioscience policies and programs, please see <http://www.michiganadvantage.org/> and <http://www.michbio.org>.

Bioscience Industry Base, 2006

Industry Subsector	Michigan		United States	
	2006	2001-06 Change	2006	2001-06 Change
Agricultural Feedstock & Chemicals				
Establishments	33	-8.8%	2,183	3.8%
Employment	750	-4.2%	105,846	-6.1%
Location Quotient	0.22		n.a.	
Direct-Effect Employment Multiplier	4.36		11.22	
Total Employment Impact	3,268		1,214,709	
Average Annual Wage	\$55,123		\$67,870	
Drugs & Pharmaceuticals				
Establishments	59	3.5%	2,654	1.9%
Employment	8,952	-20.2%	317,149	4.0%
Location Quotient	0.89		n.a.	
Direct-Effect Employment Multiplier	6.11		9.92	
Total Employment Impact	54,679		2,880,242	
Average Annual Wage	\$78,522		\$86,892	
Medical Devices & Equipment				
Establishments	513	-11.6%	15,215	0.3%
Employment	11,018	-14.6%	422,993	-0.9%
Location Quotient	0.82		n.a.	
Direct-Effect Employment Multiplier	3.18		4.85	
Total Employment Impact	35,035		1,980,128	
Average Annual Wage	\$52,168		\$59,441	
Research, Testing, & Medical Laboratories				
Establishments	434	38.4%	22,857	32.7%
Employment	13,112	27.3%	449,991	17.8%
Location Quotient	0.91		n.a.	
Direct-Effect Employment Multiplier	2.52		3.25	
Total Employment Impact	33,006		1,440,500	
Average Annual Wage	\$82,390		\$71,284	
Total Private Sector				
Establishments	252,038	-0.1%	8,575,730	10.2%
Employment	3,613,794	-5.8%	113,463,842	3.1%
Average Annual Wage	\$41,942		\$42,272	

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

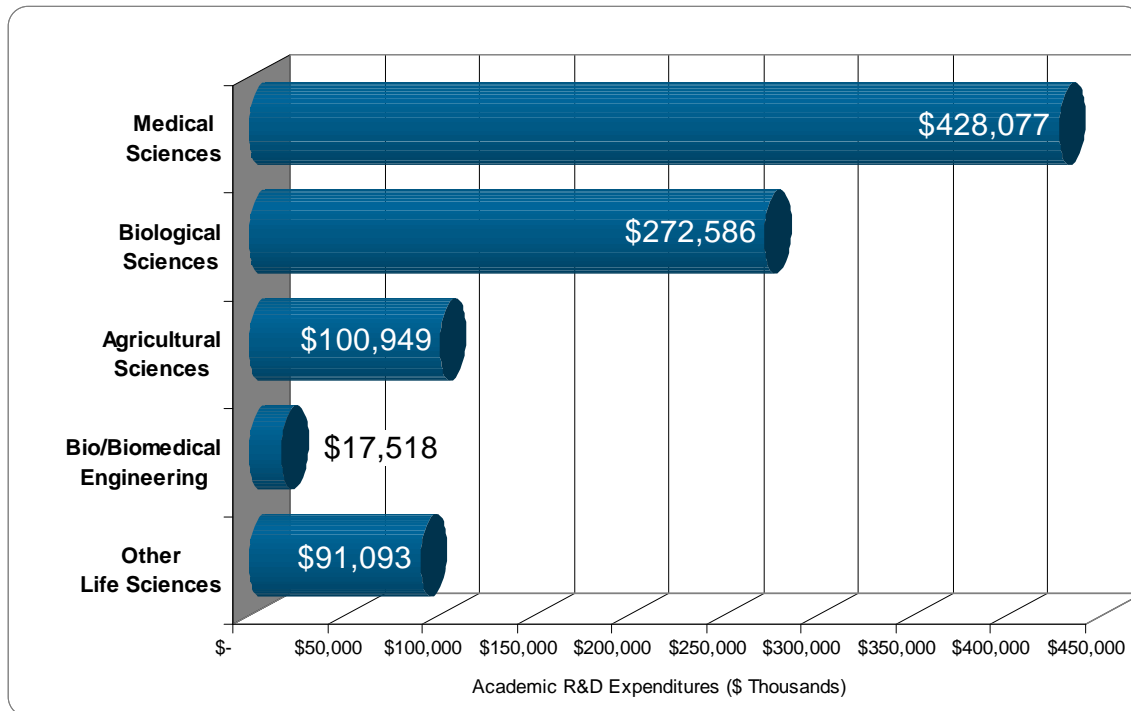
Additional Bioscience Performance Metrics

Summary of State Performance in Selected Bioscience-related Metrics

	Michigan	United States	Rank
Academic R&D Expenditures, FY 2006			
Total (\$ thousands)	\$1,472,727	\$47,760,402	11
Bioscience R&D (\$ thousands)	\$910,223	\$29,307,628	10
Bioscience Share of Total R&D	61.8%	61.4%	
Bioscience R&D Per Capita	\$90.10	\$98.10	
Change in Bioscience R&D FY 2002–2006	26.9%	36.9%	
NIH Funding, FY 2007			
Total (\$ thousands)	\$552,932	\$21,066,389	11
Per Capita Funding	\$54.90	\$69.84	
Change in Funding, FY 2002–2007	13.6%	11.2%	
Higher Education Degrees in Bioscience Fields, AY 2006	4,721	143,433	8
Employment in Bioscience-related Occupations, 2006	15,150	588,520	13
Bioscience Venture Capital Investments, 2002-2007 (\$ millions)	\$268.7	\$51,260.9	21
Bioscience and Related Patents, 2002-2007	2,225	121,817	21

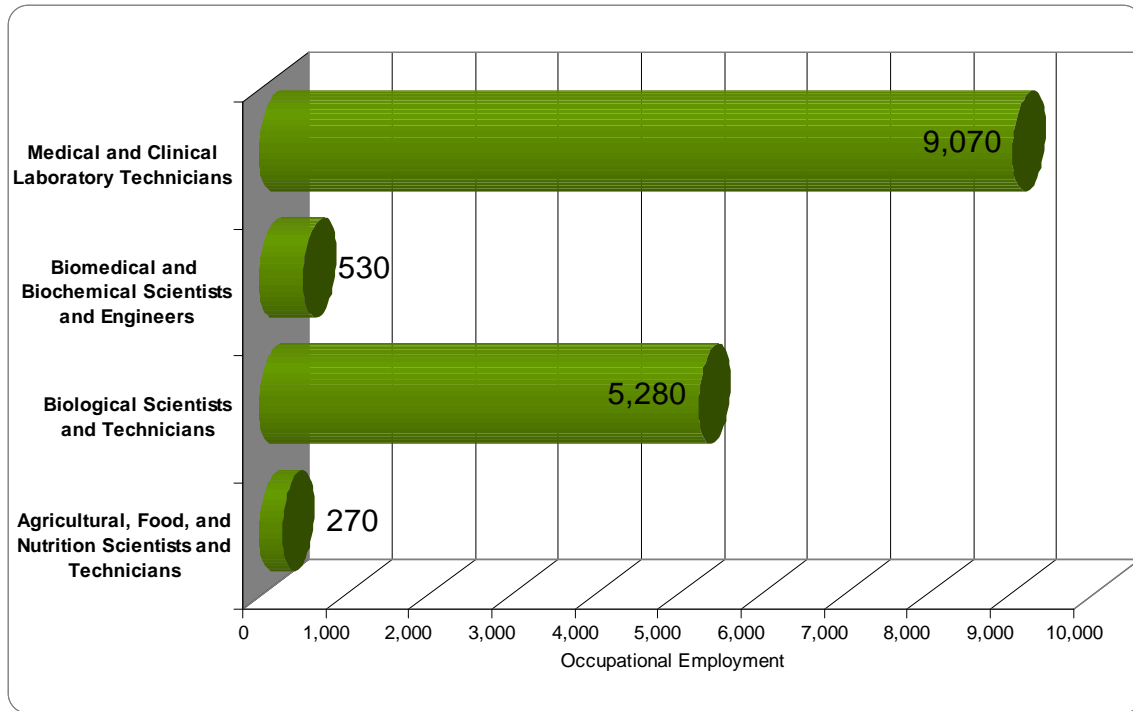
Bioscience R&D Base

Bioscience Academic R&D Expenditures in Michigan, FY 2006

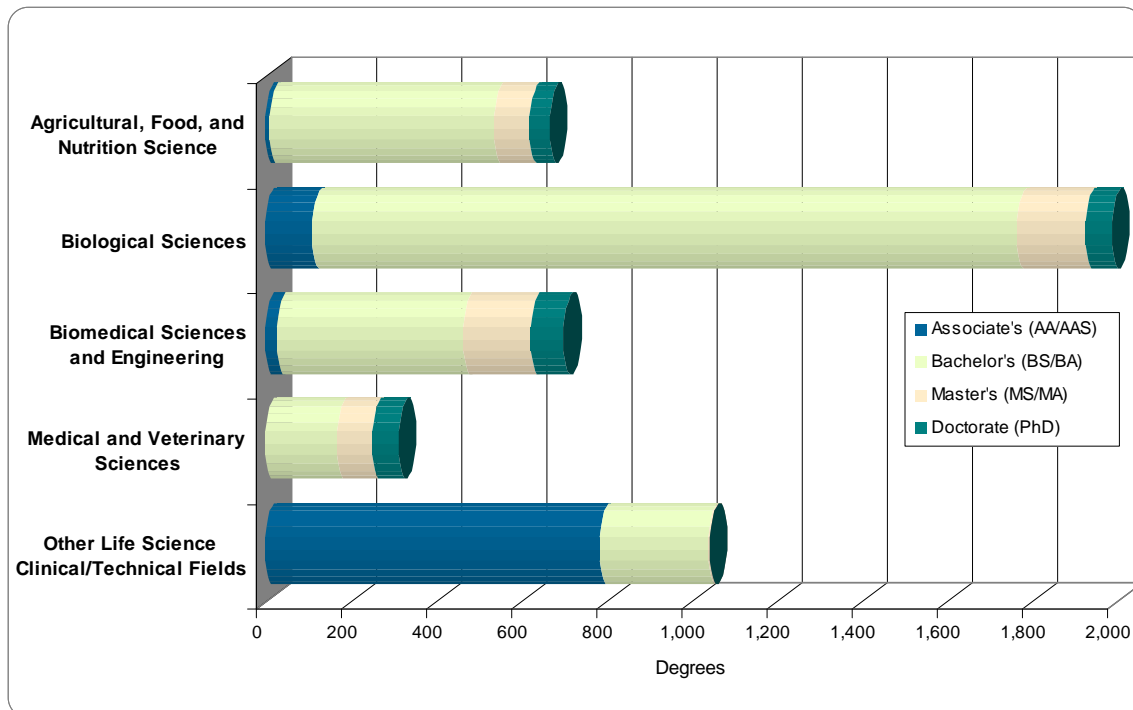


Bioscience Talent Base

Bioscience-related Occupational Employment in Michigan, 2006

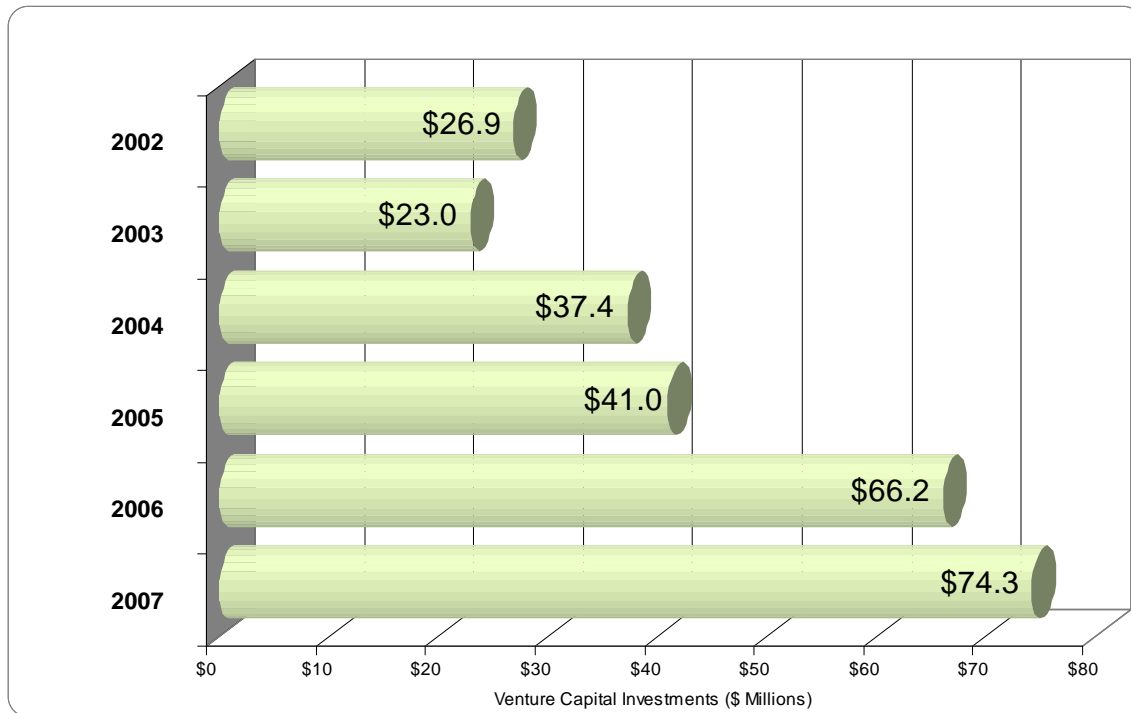


Bioscience-related Degrees in Michigan, AY 2006

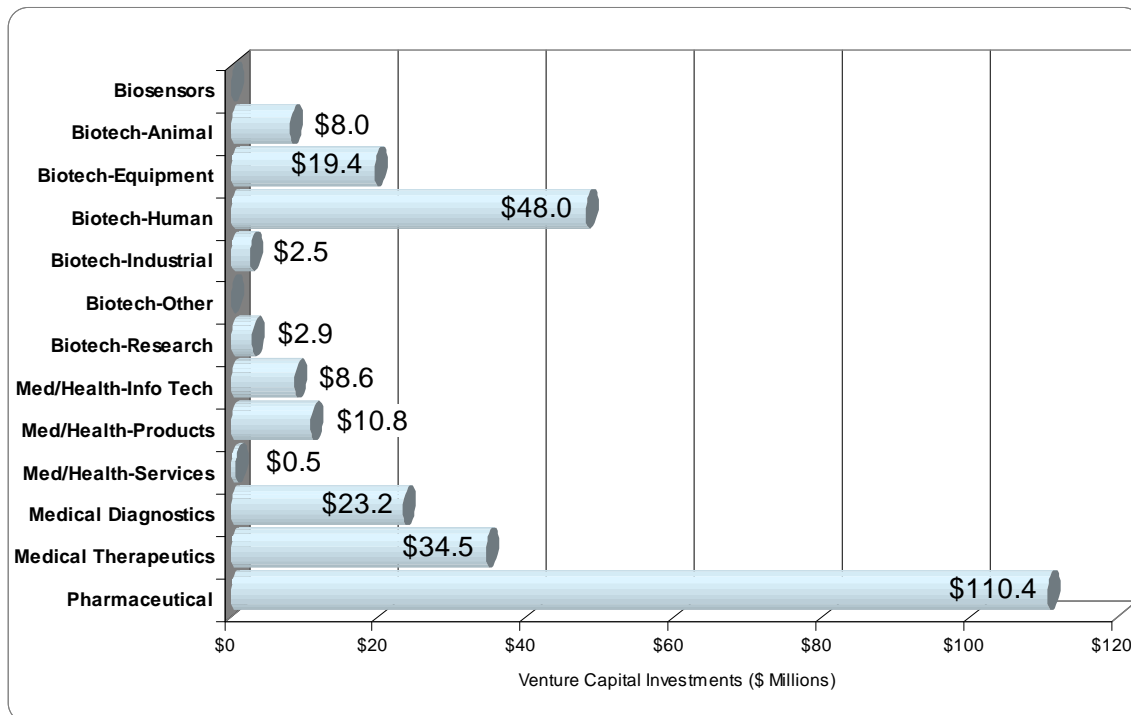


Bioscience Venture Capital

Bioscience-related Venture Capital Investments in Michigan, 2002–2007

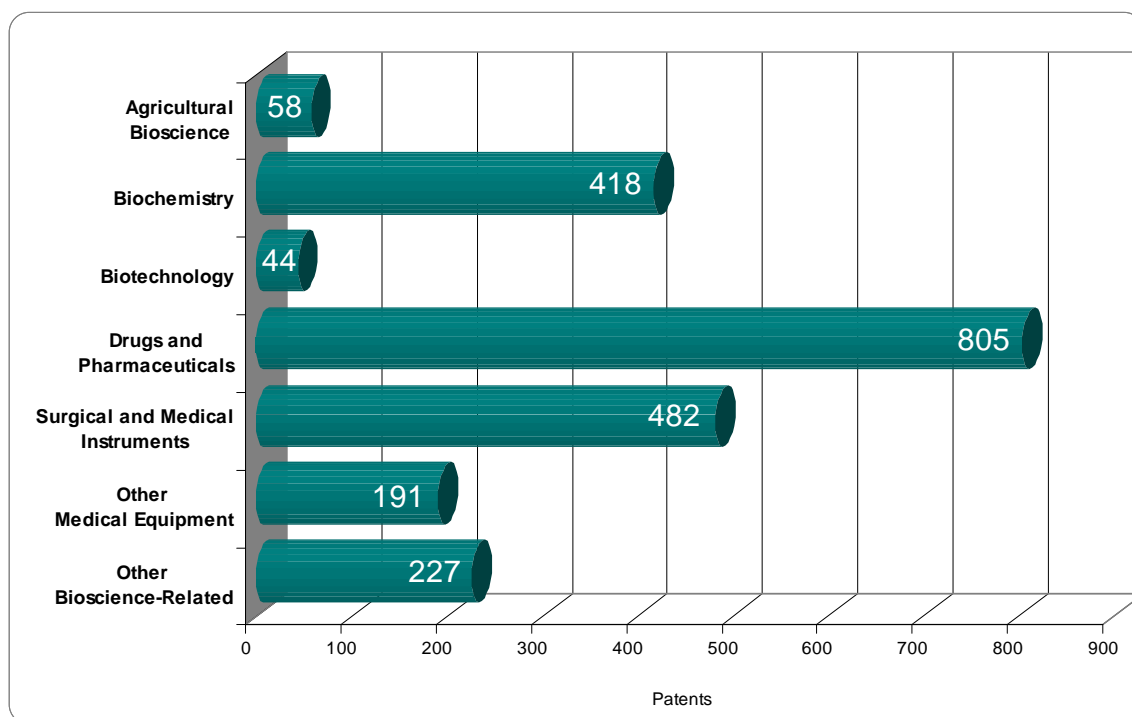


Bioscience-related Venture Capital Investments in Michigan by Segment, 2002–2007



Bioscience Patents

Bioscience-related Patents by Classification Group in Michigan, 2002–2007



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Source Notes:

Employment, Establishment, and Wage Data: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW) industry data provided by the Minnesota IMPLAN Group, 2001 and 2006.

Employment Multipliers: U.S. Bureau of Economic Analysis RIMS II Employment Multipliers, 2005 (most currently available).

Academic R&D Expenditures: National Science Foundation (NSF) Survey of Research and Development Expenditures at Universities and Colleges, 2002 and 2006.

NIH Funding: National Institutes of Health – Office of Extramural Research, Award Trends – Dollars Awarded by State, 2002 and 2007.

Higher Education Degrees: National Center for Educational Statistics, Integrated Postsecondary Education Data System (IPEDS), 2006.

Occupational Employment: U.S. Bureau of Labor Statistics, Occupational Employment Statistics (OES) survey data, 2006.

Venture Capital: Thomson Reuters VentureXpert Database, 2002-2007, as of May 1, 2008.

Patents: U.S. Patent & Trademark Office data as available from the Thomson Reuters' Delphion Patent Analysis Database, 2002–2007, as of May 1, 2008.

For a more detailed discussion of the data and methodology used please see the Appendix to the full national report.