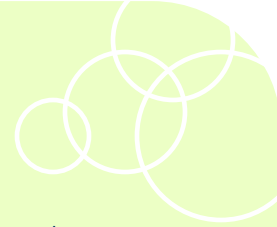


MASSACHUSETTS



Massachusetts has about 5 percent of national employment and specialized concentrations in both research, testing, and medical laboratories (location quotient of 2.32) and medical devices and equipment (2.16). Massachusetts ranks among the top 10 states across all additional key bioscience metrics. Academic research expenditures in the biosciences were \$1.12 billion in 2006, predominantly in medical sciences and biological sciences, but with a significant share in bio/biomedical engineering (\$62 million). Both overall bioscience research and research funded by the National Institutes of Health grew faster than the national average. There were \$7 billion in venture capital investments in the past 6 years, reaching a peak of \$1.5 billion in 2007. The largest single investment sector was human biotechnology, accounting for 40 percent of all venture capital investments.

Major Industry Developments and Recent Successes

- **Bristol-Myers Squibb** broke ground in May 2007 on its two-phase, \$1.1 billion biomanufacturing facility at Devens. The facility, representing the single largest capital investment ever made by Bristol-Myers Squibb, will be completed in 2009 and employ more than 500 workers.
- **Genzyme** announced in 2007 a \$150 million expansion of its biomanufacturing facility in Allston.
- **AstraZeneca** announced in 2007 a \$100 million expansion of its R&D facility in Waltham.

Recent State Initiatives

Shortly after the last BIO report in 2006, the state legislature created a new **Massachusetts Life Sciences Center** within the Executive Office of Housing and Economic Development. The Life Sciences Center now operates a matching-grant program to assist universities in cooperative research with industry and in funding start-up operations for new faculty investigators.

Also in 2006, key stakeholders formed the **Massachusetts Life Sciences Collaborative**, combining leaders from the life-science “super cluster,” comprising biopharma, medical devices, education, research, healthcare delivery, and insurers. The collaborative’s work was an input to Governor Deval Patrick’s proposal in 2007 of the **Life Sciences Initiative**, a comprehensive development strategy and funding package summarized below.

The **Massachusetts Biotechnology Education Foundation** associated with the Biotechnology Council launched a **Life Science Talent Consortium** to link the industry with bioscience programs across the state’s higher-education system. The Foundation also now offers the **BioTeach** program for K-12 teachers, which returns trainees to the classroom with not only a new curriculum but also \$14,000 in equipment and supplies.

Pending Proposals

The Life Sciences Initiative, which was still in legislative conference at the deadline for this report, is a 10-year, \$1 billion umbrella program including \$500 million in capital funding, \$250 million in granting authority, and \$250 million in tax credits. Among other provisions, the pending legislation will strengthen the role of the Life Sciences Center; provide funding for major R&D facilities at both the University of Massachusetts (UMass) at Worcester and UMass Amherst; make miscellaneous improvements in bio-manufacturing and wet-lab incubation; extend the net operating loss carry-forward

to 15 years; ease provisions of the state's R&D tax credit; and provide sales tax exemptions for bioscience R&D and manufacturing facilities.

For additional information on Massachusetts' bioscience policies and programs, please see <http://www.masssc.com> and <http://www.massbio.org>.

Bioscience Industry Base, 2006

Industry Subsector	Massachusetts		United States	
	2006	2001-06 Change	2006	2001-06 Change
Agricultural Feedstock & Chemicals				
Establishments	27	1.7%	2,183	3.8%
Employment	448	-11.6%	105,846	-6.1%
Location Quotient	0.17		n.a.	
Direct-Effect Employment Multiplier	4.49		11.22	
Total Employment Impact	2,014		1,214,709	
Average Annual Wage	\$66,563		\$67,870	
Drugs & Pharmaceuticals				
Establishments	84	-2.3%	2,654	1.9%
Employment	8,105	4.0%	317,149	4.0%
Location Quotient	1.04		n.a.	
Direct-Effect Employment Multiplier	6.34		9.92	
Total Employment Impact	51,397		2,880,242	
Average Annual Wage	\$99,554		\$86,892	
Medical Devices & Equipment				
Establishments	448	-4.9%	15,215	0.3%
Employment	22,498	-16.2%	422,993	-0.9%
Location Quotient	2.16		n.a.	
Direct-Effect Employment Multiplier	3.51		4.85	
Total Employment Impact	78,996		1,980,128	
Average Annual Wage	\$78,962		\$59,441	
Research, Testing, & Medical Laboratories				
Establishments	820	23.7%	22,857	32.7%
Employment	25,637	25.5%	449,991	17.8%
Location Quotient	2.32		n.a.	
Direct-Effect Employment Multiplier	2.42		3.25	
Total Employment Impact	61,970		1,440,500	
Average Annual Wage	\$91,283		\$71,284	
Total Private Sector				
Establishments	201,693	8.3%	8,575,730	10.2%
Employment	2,788,545	-2.6%	113,463,842	3.1%
Average Annual Wage	\$52,798		\$42,272	

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

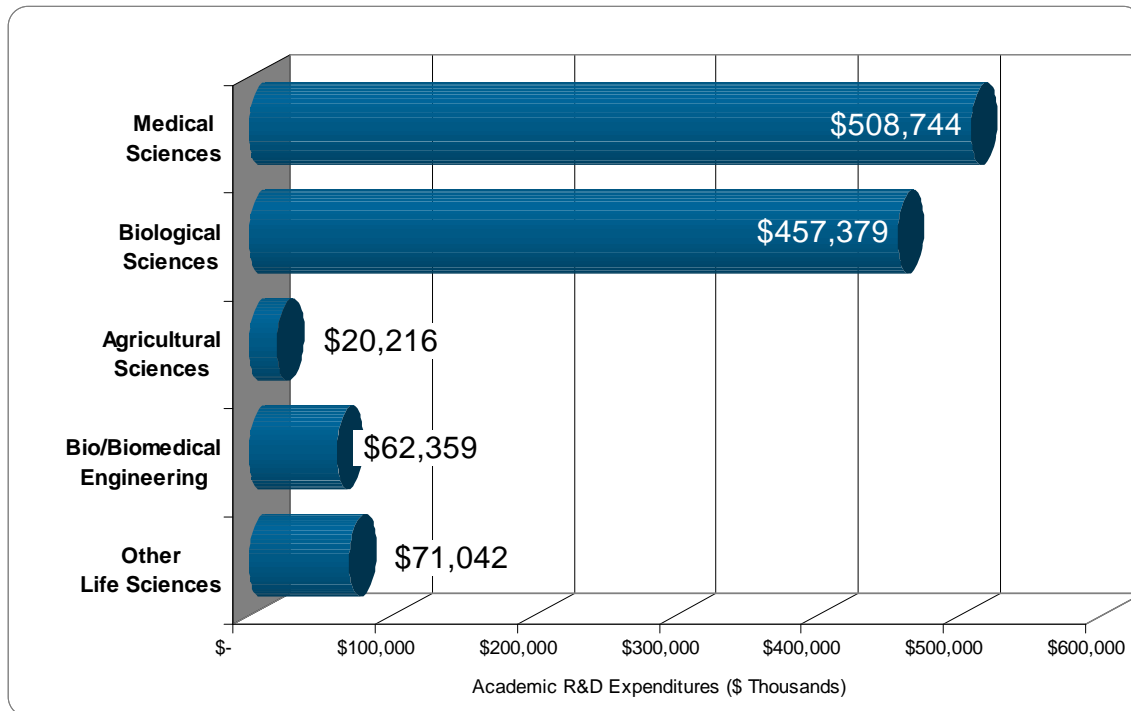
Additional Bioscience Performance Metrics

Summary of State Performance in Selected Bioscience-related Metrics

	Massachusetts	United States	Rank
Academic R&D Expenditures, FY 2006			
Total (\$ thousands)	\$2,158,748	\$47,760,402	6
Bioscience R&D (\$ thousands)	\$1,119,740	\$29,307,628	8
Bioscience Share of Total R&D	51.9%	61.4%	
Bioscience R&D Per Capita	\$174.02	\$98.10	
Change in Bioscience R&D FY 2002–2006	39.0%	36.9%	
NIH Funding, FY 2007			
Total (\$ thousands)	\$2,236,110	\$21,066,389	2
Per Capita Funding	\$346.70	\$69.84	
Change in Funding, FY 2002–2007	19.4%	11.2%	
Higher Education Degrees in Bioscience Fields, AY 2006	4,321	143,433	9
Employment in Bioscience-related Occupations, 2006	30,780	588,520	5
Bioscience Venture Capital Investments, 2002-2007 (\$ millions)	\$7,090.7	\$51,260.9	2
Bioscience and Related Patents, 2002-2007	9,443	121,817	2

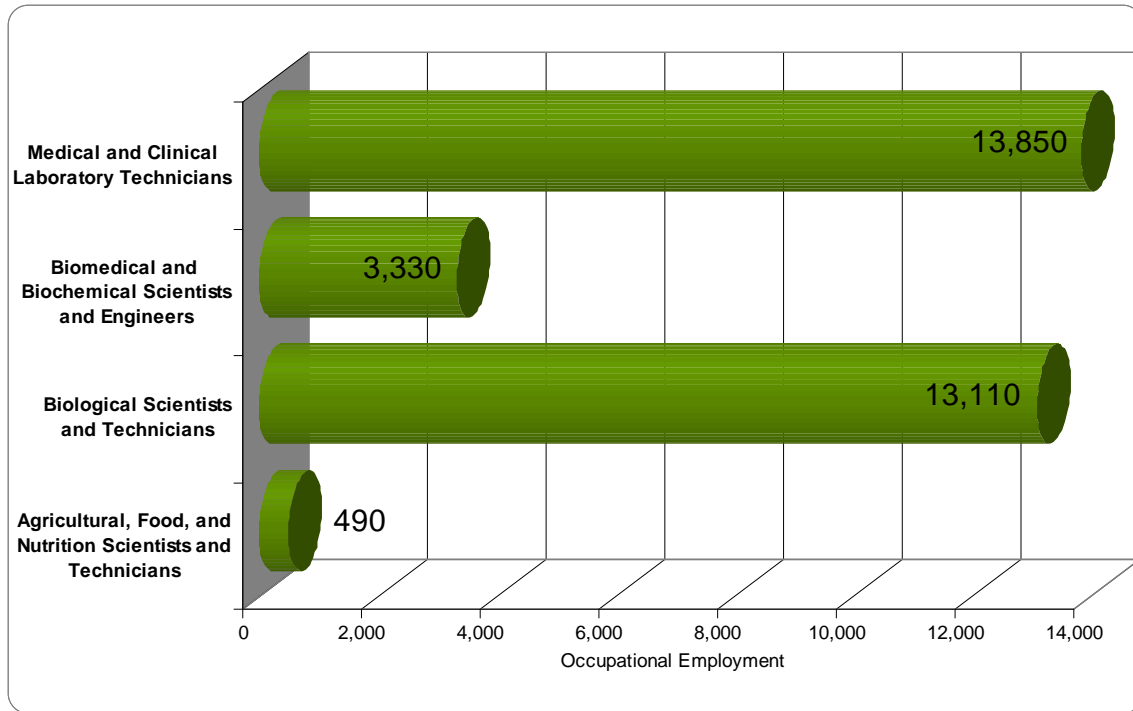
Bioscience R&D Base

Bioscience Academic R&D Expenditures in Massachusetts, FY 2006

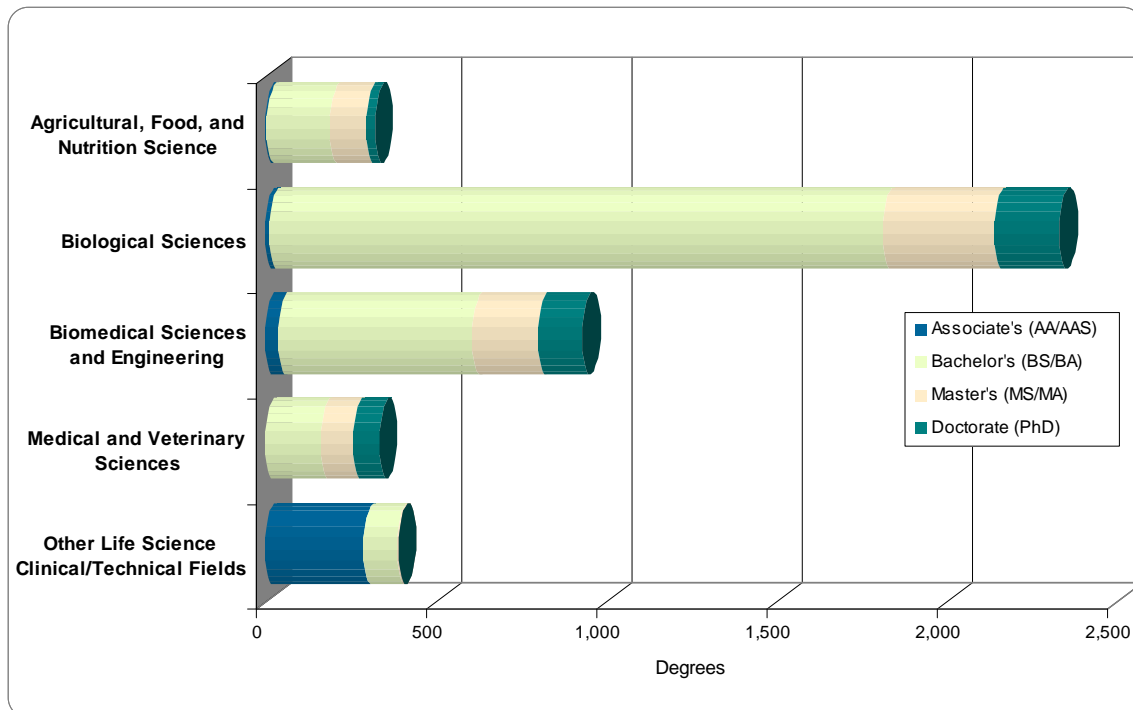


Bioscience Talent Base

Bioscience-related Occupational Employment in Massachusetts, 2006

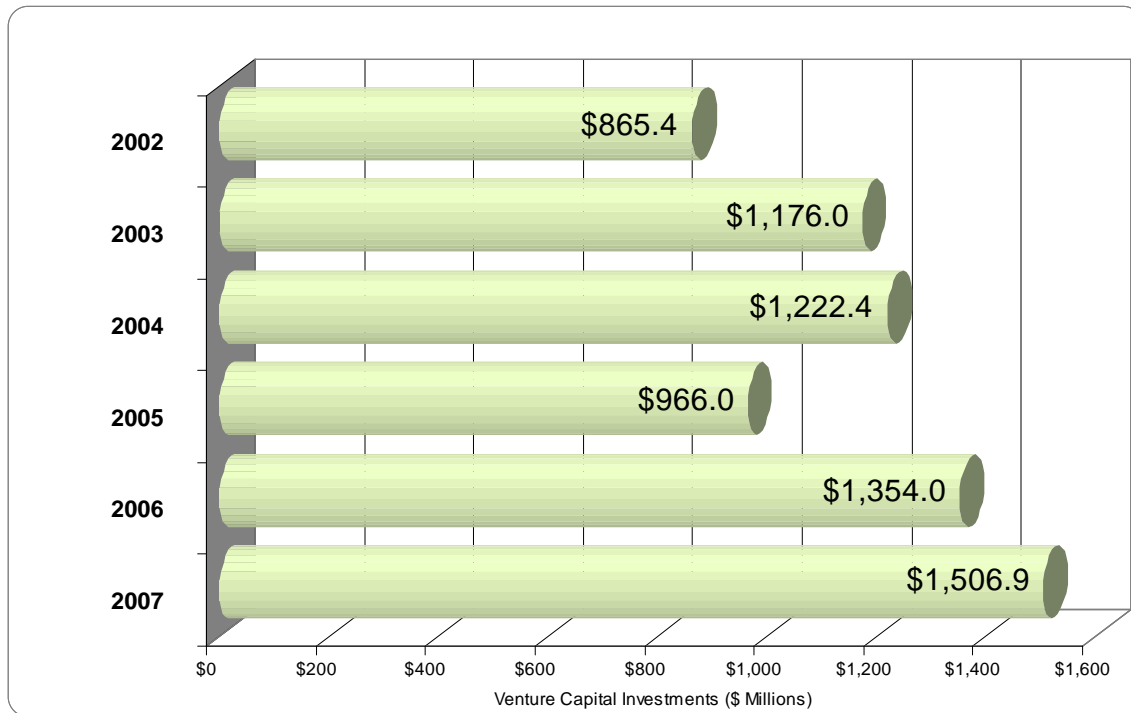


Bioscience-related Degrees in Massachusetts, AY 2006

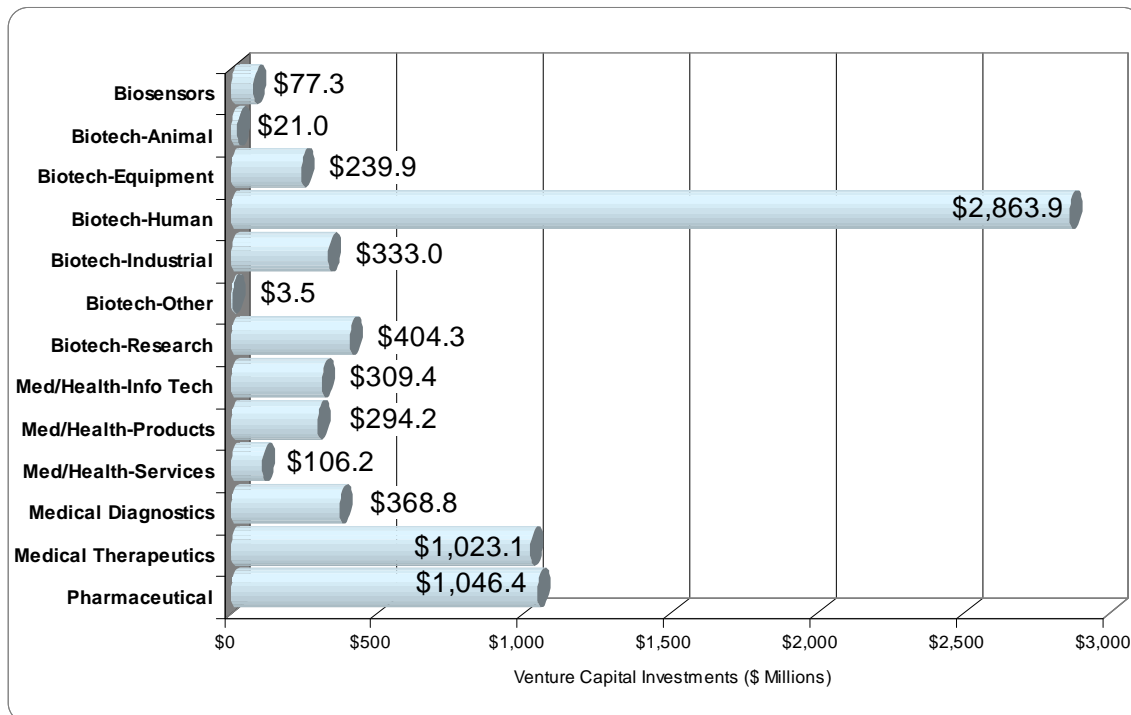


Bioscience Venture Capital

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

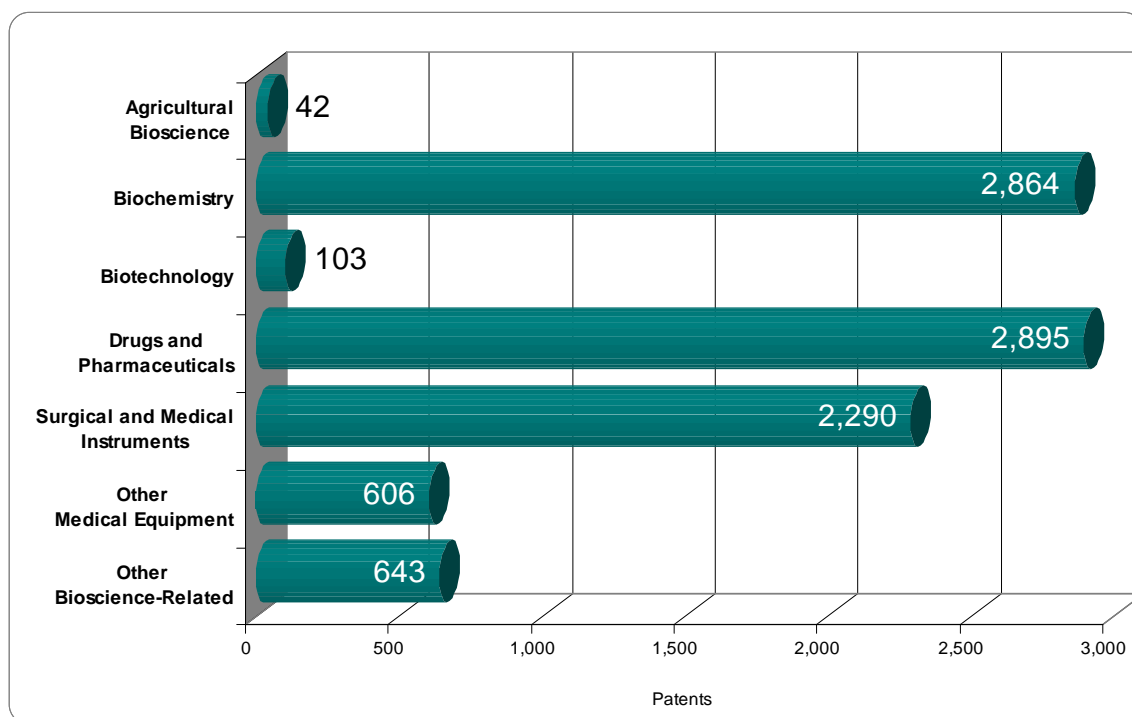


Bioscience-related Venture Capital Investments in Massachusetts by Segment, 2002–2007



Bioscience Patents

Bioscience-related Patents by Classification Group in Massachusetts, 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.