

WEST VIRGINIA

West Virginia's largest bioscience subsector, drugs and pharmaceuticals, has emerged since 2001 and had a specialized employment base in 2006 (location quotient of 1.51). Agricultural feedstock and chemicals was also a specialized industry subsector (1.47). Academic bioscience research expenditures totaled more than \$96 million in 2006, mainly in medical sciences (\$49 million), followed by nearly equal shares for agricultural and biological sciences. The \$4 million in venture capital invested in the biosciences in the past 6 years was all in the medical/health services sector. The 86 bioscience patents over the same period were well diversified, led by biochemistry, surgical and medical instruments, and drugs and pharmaceuticals.

Major Industry Developments and Recent Successes

- Morgantown-based **Protea Biosciences** develops new products and services that improve the speed, quality, and reproducibility of protein mass spectrometry data obtained from biological samples. During the past 12 months, the company has released more than 50 new products and commenced offering protein identification services. Protea has 19 full-time employees, including five Ph.D.-level scientists.
- The **Mid-Atlantic Technology, Research and Innovation Center (MATRIC)** is a nonprofit based in Charleston that conducts R&D and seeks to commercialize resulting products and services. Its areas of focus include chemical and environmental technologies, health and life sciences, and advanced engineering systems. Created in 2003 to take advantage of talented scientists and engineers who were being laid off as a result of downsizing of a major Dow Chemical R&D lab, MATRIC now employs 75 scientists and has \$10 million in contracts.

Recent State Initiatives

Legislation was passed and signed in 2008 creating the **West Virginia Research Trust Fund**. This \$50 million Fund will match state dollars with private donations to stimulate world-class research at the State's two research universities, West Virginia University (WVU) and Marshall University (MU). The funds will be used to support expansions to faculty research and infrastructure. Four areas are targeted for funding, of which one is biological, biotechnical, and biomedical sciences. In 2007, \$10 million was invested through the **Eminent Scholars Recruitment and Enhancement Program**.

The \$48 million **Robert C. Byrd Biotechnology Science Center** opened at MU in late 2006. The State of West Virginia provided \$10 million toward the cost of construction. The Center brings together under one roof the faculty, staff, and students of the School of Medicine and the College of Science.

The **Blanchette Rockefeller Neurosciences Institute** will open in 2008, as will the **Biomedical Science Research Lab Facility** at WVU. The latter will provide facilities for expanded research programs within WVU's Health Sciences Center. An expansion of the **Mary Babb Randolph Cancer Center** is underway. The Institute for Development of Entrepreneurial Advances at MU is establishing a 22,000-square-foot incubator primarily geared toward commercializing research on molecular life sciences and medicine.

For additional information on West Virginia's bioscience policies and programs, please see <http://www.wvdo.org>

Bioscience Industry Base, 2006

Industry Subsector	West Virginia		United States	
	2006	2001-06 Change	2006	2001-06 Change
Agricultural Feedstock & Chemicals				
Establishments	15	-15.0%	2,183	3.8%
Employment	779	-70.9%	105,846	-6.1%
Location Quotient	1.47		n.a.	
Direct-Effect Employment Multiplier	7.15		11.22	
Total Employment Impact	5,566		1,214,709	
Average Annual Wage	\$79,740		\$67,870	
Drugs & Pharmaceuticals				
Establishments	4	-5.2%	2,654	1.9%
Employment	2,390	68.7%	317,149	4.0%
Location Quotient	1.51		n.a.	
Direct-Effect Employment Multiplier	4.17		9.92	
Total Employment Impact	9,966		2,880,242	
Average Annual Wage	\$68,029		\$86,892	
Medical Devices & Equipment				
Establishments	44	1.1%	15,215	0.3%
Employment	879	20.3%	422,993	-0.9%
Location Quotient	0.42		n.a.	
Direct-Effect Employment Multiplier	2.40		4.85	
Total Employment Impact	2,106		1,980,128	
Average Annual Wage	\$40,297		\$59,441	
Research, Testing, & Medical Laboratories				
Establishments	69	6.5%	22,857	32.7%
Employment	858	14.7%	449,991	17.8%
Location Quotient	0.38		n.a.	
Direct-Effect Employment Multiplier	1.83		3.25	
Total Employment Impact	1,573		1,440,500	
Average Annual Wage	\$41,425		\$71,284	
Total Private Sector				
Establishments	44,523	1.3%	8,575,730	10.2%
Employment	567,971	2.9%	113,463,842	3.1%
Average Annual Wage	\$31,999		\$42,272	

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

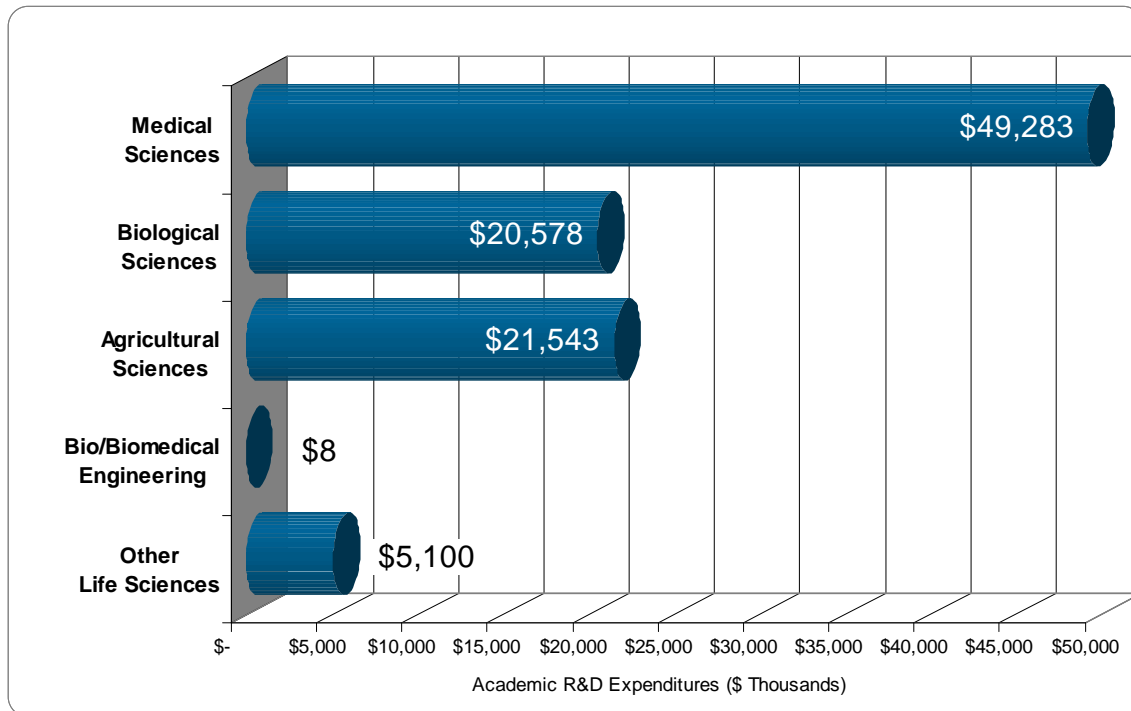
Additional Bioscience Performance Metrics

Summary of State Performance in Selected Bioscience-related Metrics

	West Virginia	United States	Rank
Academic R&D Expenditures, FY 2006			
Total (\$ thousands)	\$148,615	\$47,760,402	45
Bioscience R&D (\$ thousands)	\$96,512	\$29,307,628	42
Bioscience Share of Total R&D	64.9%	61.4%	
Bioscience R&D Per Capita	\$53.36	\$98.10	
Change in Bioscience R&D FY 2002–2006	80.4%	36.9%	
NIH Funding, FY 2007			
Total (\$ thousands)	\$24,691	\$21,066,389	46
Per Capita Funding	\$13.63	\$69.84	
Change in Funding, FY 2002–2007	61.9%	11.2%	
Higher Education Degrees in Bioscience Fields, AY 2006	780	143,433	38
Employment in Bioscience-related Occupations, 2006	2,330	588,520	41
Bioscience Venture Capital Investments, 2002-2007 (\$ millions)	\$4.0	\$51,260.9	44
Bioscience and Related Patents, 2002-2007	86	121,817	49

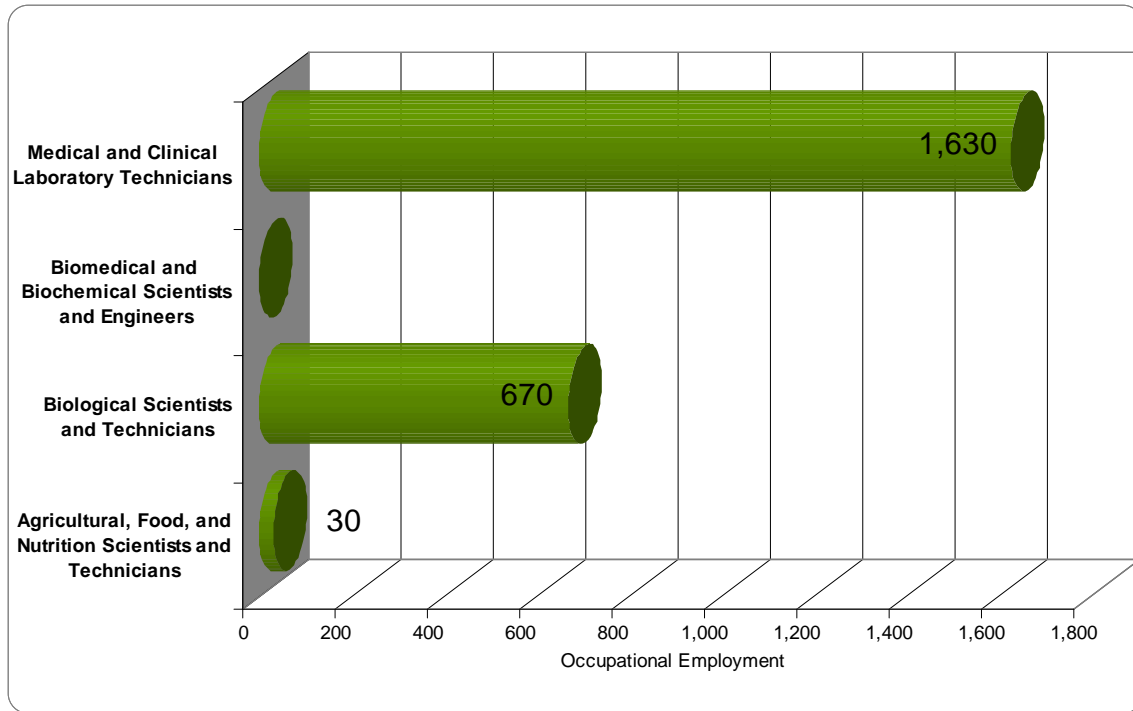
Bioscience R&D Base

Bioscience Academic R&D Expenditures in West Virginia, FY 2006

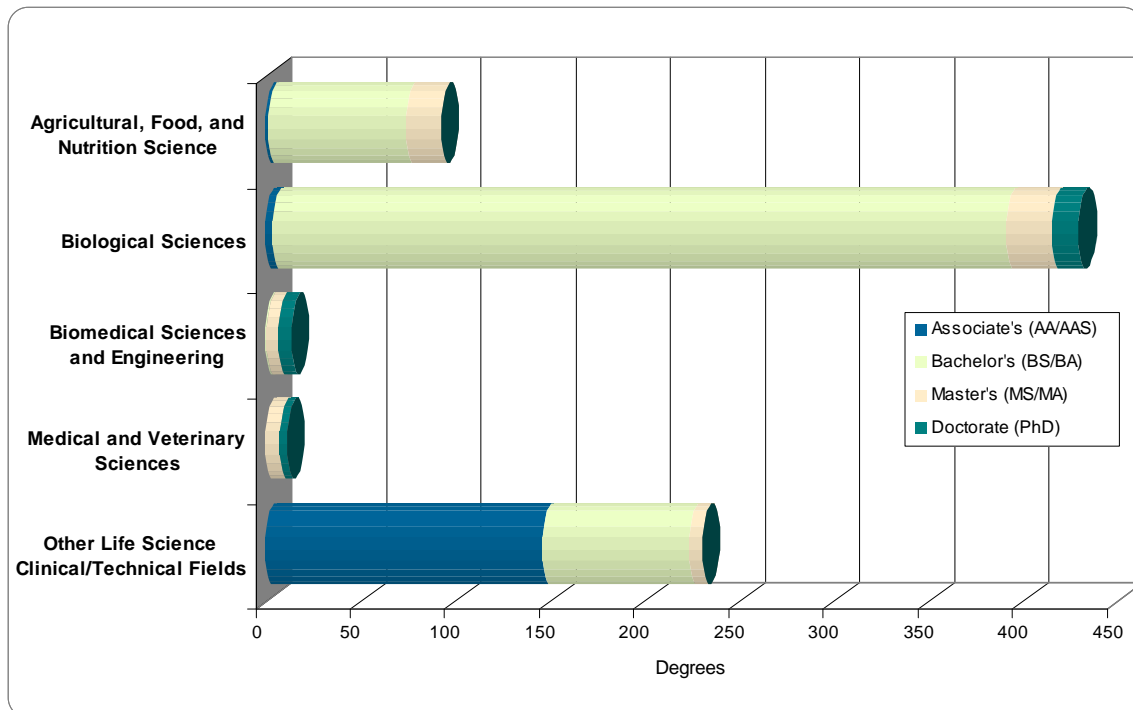


Bioscience Talent Base

Bioscience-related Occupational Employment in West Virginia, 2006

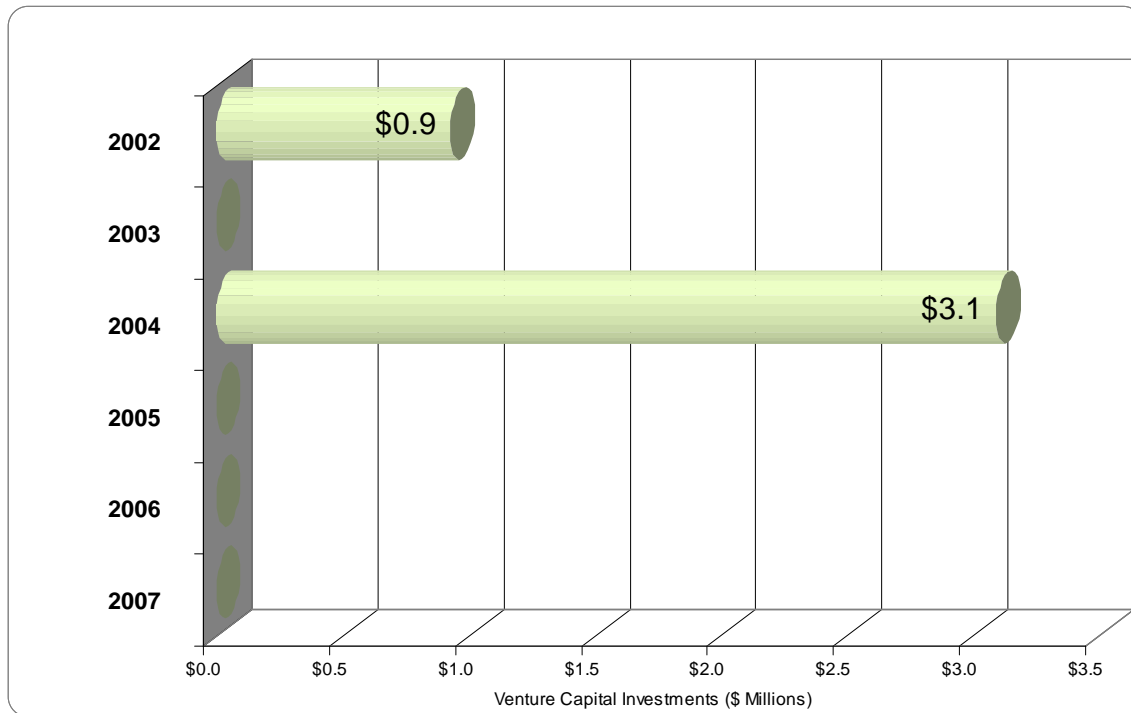


Bioscience-related Degrees in West Virginia, AY 2006

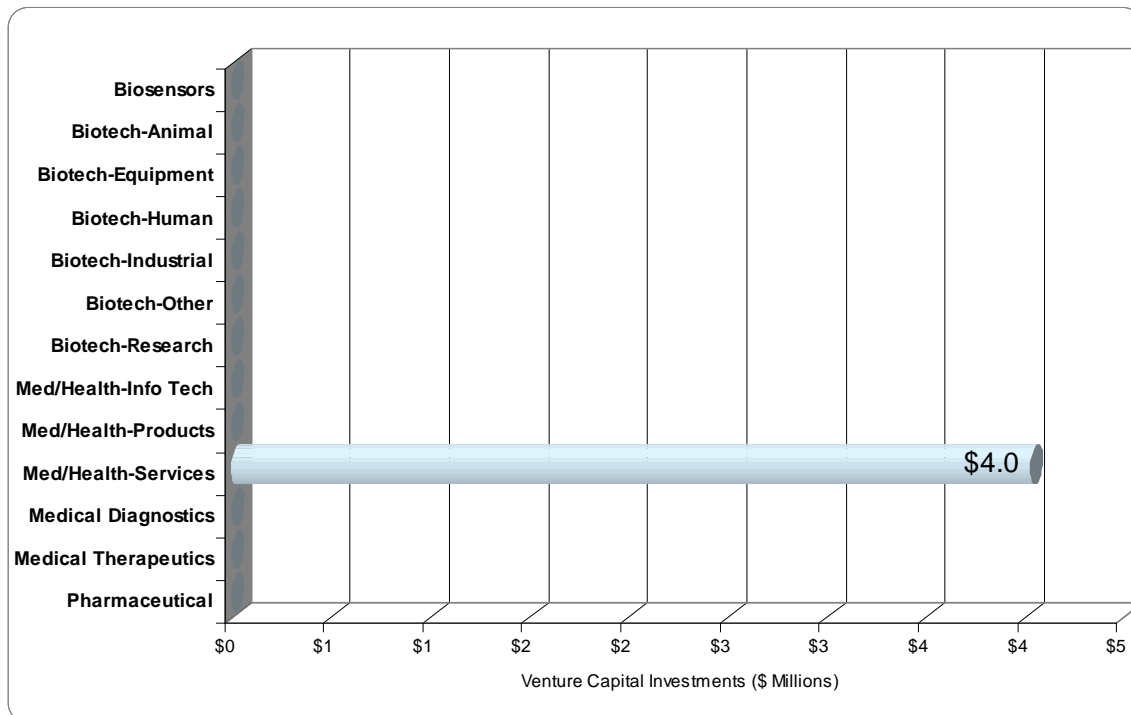


Bioscience Venture Capital

Bioscience-related Venture Capital Investments in West Virginia, 2002–2007

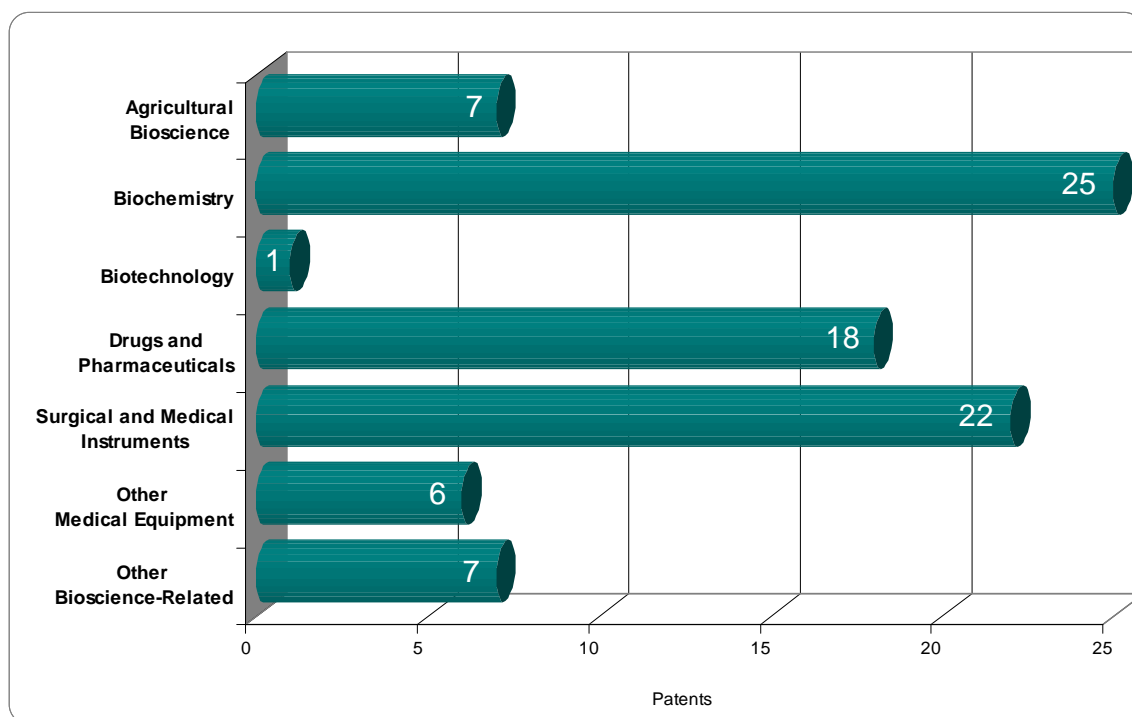


Bioscience-related Venture Capital Investments in West Virginia by Segment, 2002–2007



Bioscience Patents

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



State Bioscience Contacts

State Agency Contact:

Mr. Jamie Gaucher
 Manager, Technology-Based Economic Activity
 West Virginia Development Office
 Capital Complex, Building 6, Room 553
 1900 Kanawha Boulevard East
 Charleston, WV 25305
 (304) 957-2018
jgaucher@wvdo.org

State Bio Association Contact:

n/a

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 VentureExpert 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.