

## VERMONT

The largest bioscience subsector in Vermont is medical devices and equipment (799 jobs), a sector that has emerged since 2001. The State's \$107 million in academic bioscience research expenditures in 2006 represented a very high share (88 percent) of total academic research. The largest categories were medical and biological sciences. Over the past 6 years, \$10 million in venture capital was invested in the biosciences, split among human biotechnology and medical/health services. The 135 bioscience patents in the same period were well diversified, led by surgical and medical instruments, drugs and pharmaceuticals, and biochemistry.

### Recent State Initiatives

Vermont's economic development efforts are largely focused on growing the State's "green" industry sector, with a particular focus on environmental engineering. Since 2003, the State has had a biofuels initiative, with a primary focus on the development of biodiesel. The State's efforts to grow its renewable energy sector are closely tied to supporting its agricultural sector.

During the past several years, the University of Vermont (UVM) has become much more active in technology transfer and commercialization, spinning out a number of companies, many of which are biomedical companies. **UVM Ventures**, which is an arm of the University's tech transfer office, provides early-stage capital through its **Pre-Seed Capital Fund** and its **Innovations Fund**. The Pre-Seed Capital Fund makes awards of between \$10,000 and \$20,000 to UVM faculty, researchers, and students to develop prototypes or preliminary business plans. The Innovations Fund facilitates final validation of prototypes and other proof-of-principle work. Innovation awards are in the range of \$20,000 to \$200,000.

For additional information on Vermont's bioscience policies and programs, please see <http://www.thinkvermont.com>.

### Major Industry Developments and Recent Successes

- **Apollo BioSciences Inc.**, a start-up company being developed around technology developed by a UVM researcher, has raised \$130,000 via three EPSCoR (Experimental Program to Stimulate Competitive Research) Small Business Innovation Research (SBIR) Phase 0 awards and a Phase I Small Business Technology Transfer (STTR) award from the National Institutes of Health.
- Other successful UVM spin-off companies include **Green Mountain Antibodies**, which manufactures biological molecules for industry, health, and research; **BioTek Instruments**, a global leader in the development, manufacture, and sale of microplate instrumentation used to accelerate the drug discovery process; and **Vermedx**, recognized for its successful program of diabetes care.

## Bioscience Industry Base, 2006

Industry Subsector	Vermont		United States	
	2006	2001-06 Change	2006	2001-06 Change
<b>Agricultural Feedstock &amp; Chemicals</b>				
Establishments	3	10.0%	2,183	3.8%
Employment	5	-73.3%	105,846	-6.1%
Location Quotient	0.02		n.a.	
Direct-Effect Employment Multiplier	2.26		11.22	
Total Employment Impact	12		1,214,709	
Average Annual Wage	\$22,530		\$67,870	
<b>Drugs &amp; Pharmaceuticals</b>				
Establishments	4	7.5%	2,654	1.9%
Employment	39	35.3%	317,149	4.0%
Location Quotient	0.06		n.a.	
Direct-Effect Employment Multiplier	2.77		9.92	
Total Employment Impact	109		2,880,242	
Average Annual Wage	\$53,754		\$86,892	
<b>Medical Devices &amp; Equipment</b>				
Establishments	38	21.0%	15,215	0.3%
Employment	799	90.5%	422,993	-0.9%
Location Quotient	0.85		n.a.	
Direct-Effect Employment Multiplier	2.31		4.85	
Total Employment Impact	1,845		1,980,128	
Average Annual Wage	\$50,162		\$59,441	
<b>Research, Testing, &amp; Medical Laboratories</b>				
Establishments	41	49.6%	22,857	32.7%
Employment	250	78.3%	449,991	17.8%
Location Quotient	0.25		n.a.	
Direct-Effect Employment Multiplier	1.86		3.25	
Total Employment Impact	464		1,440,500	
Average Annual Wage	\$50,749		\$71,284	
<b>Total Private Sector</b>				
Establishments	22,964	2.0%	8,575,730	10.2%
Employment	251,368	0.6%	113,463,842	3.1%
Average Annual Wage	\$34,943		\$42,272	

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

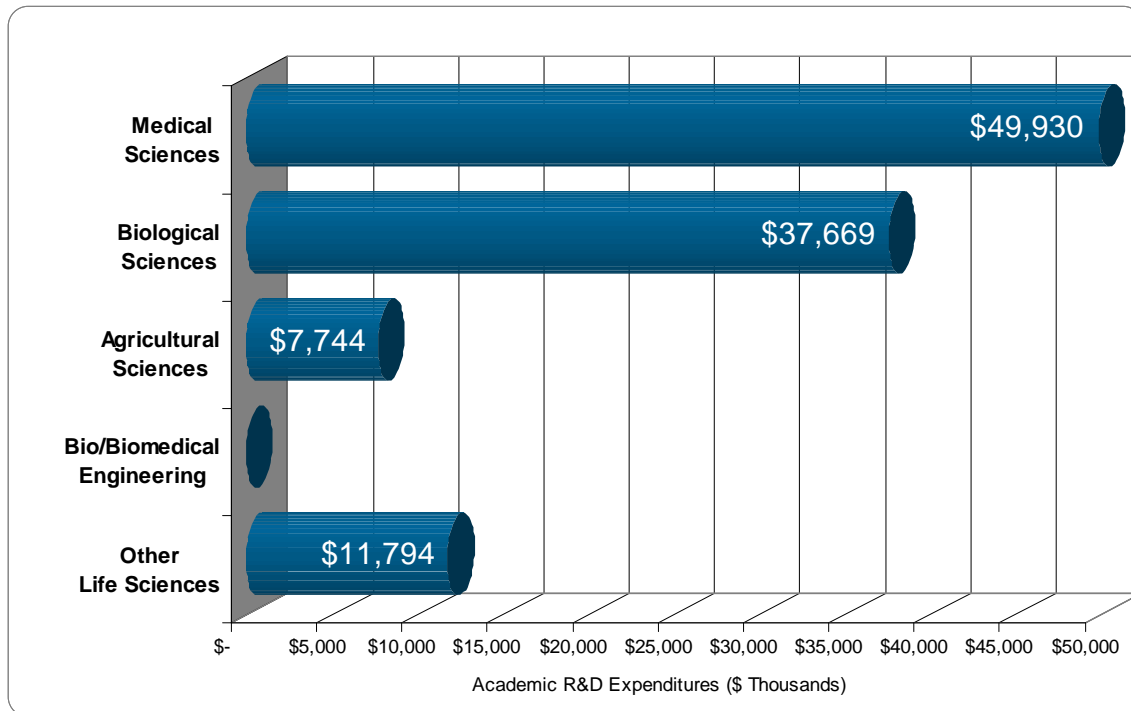
## Additional Bioscience Performance Metrics

### Summary of State Performance in Selected Bioscience-related Metrics

	Vermont	United States	Rank
Academic R&D Expenditures, FY 2006			
Total (\$ thousands)	\$121,841	\$47,760,402	47
Bioscience R&D (\$ thousands)	\$107,137	\$29,307,628	41
Bioscience Share of Total R&D	87.9%	61.4%	
Bioscience R&D Per Capita	\$172.59	\$98.10	
Change in Bioscience R&D FY 2002–2006	33.0%	36.9%	
NIH Funding, FY 2007			
Total (\$ thousands)	\$66,558	\$21,066,389	39
Per Capita Funding	\$107.14	\$69.84	
Change in Funding, FY 2002–2007	4.3%	11.2%	
Higher Education Degrees in Bioscience Fields, AY 2006	441	143,433	48
Employment in Bioscience-related Occupations, 2006	930	588,520	51
Bioscience Venture Capital Investments, 2002-2007 (\$ millions)	\$10.3	\$51,260.9	42
Bioscience and Related Patents, 2002-2007	135	121,817	47

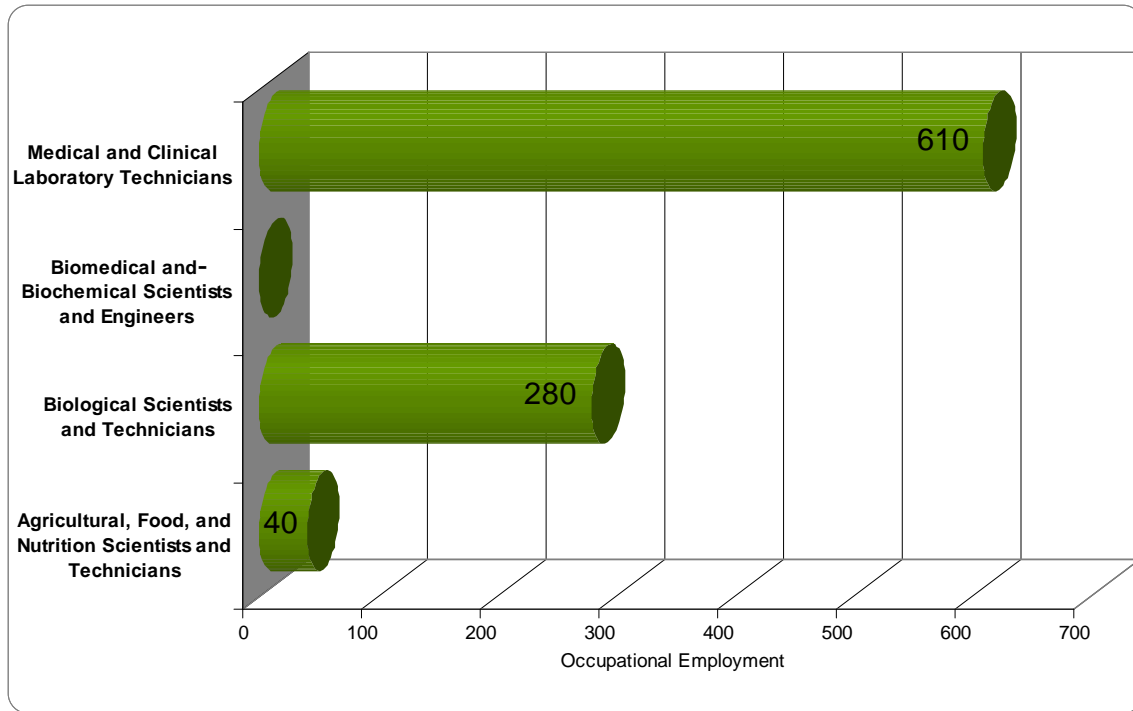
## Bioscience R&D Base

### Bioscience Academic R&D Expenditures in Vermont, FY 2006

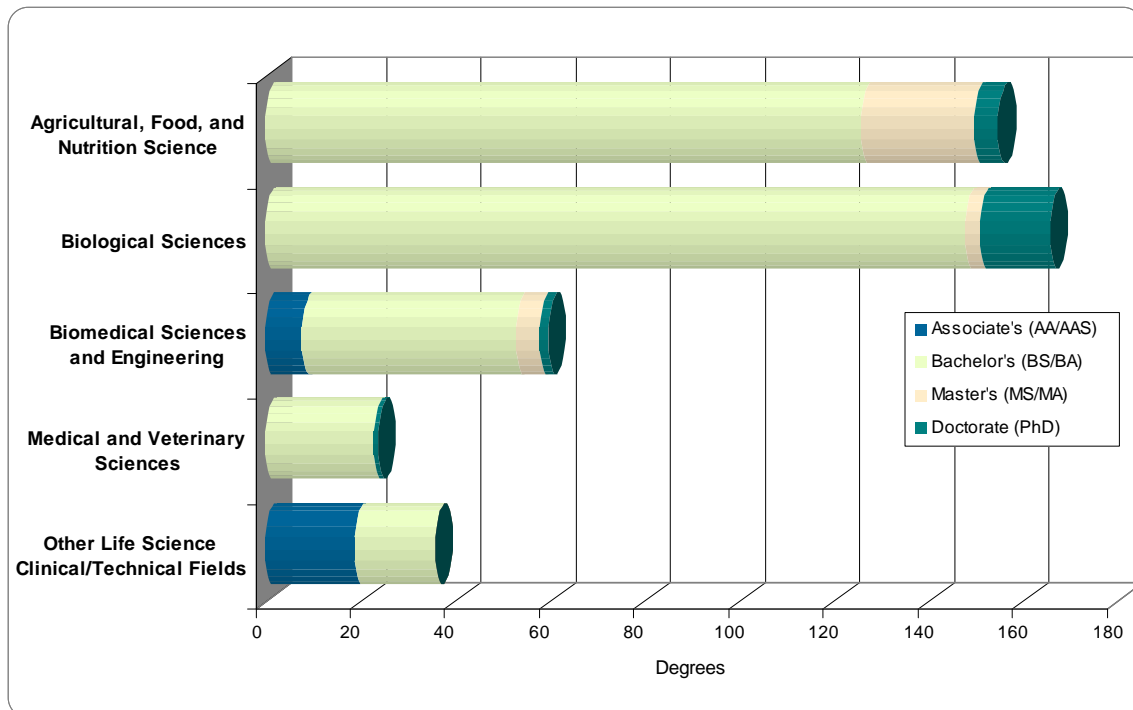


## Bioscience Talent Base

### Bioscience-related Occupational Employment in Vermont, 2006

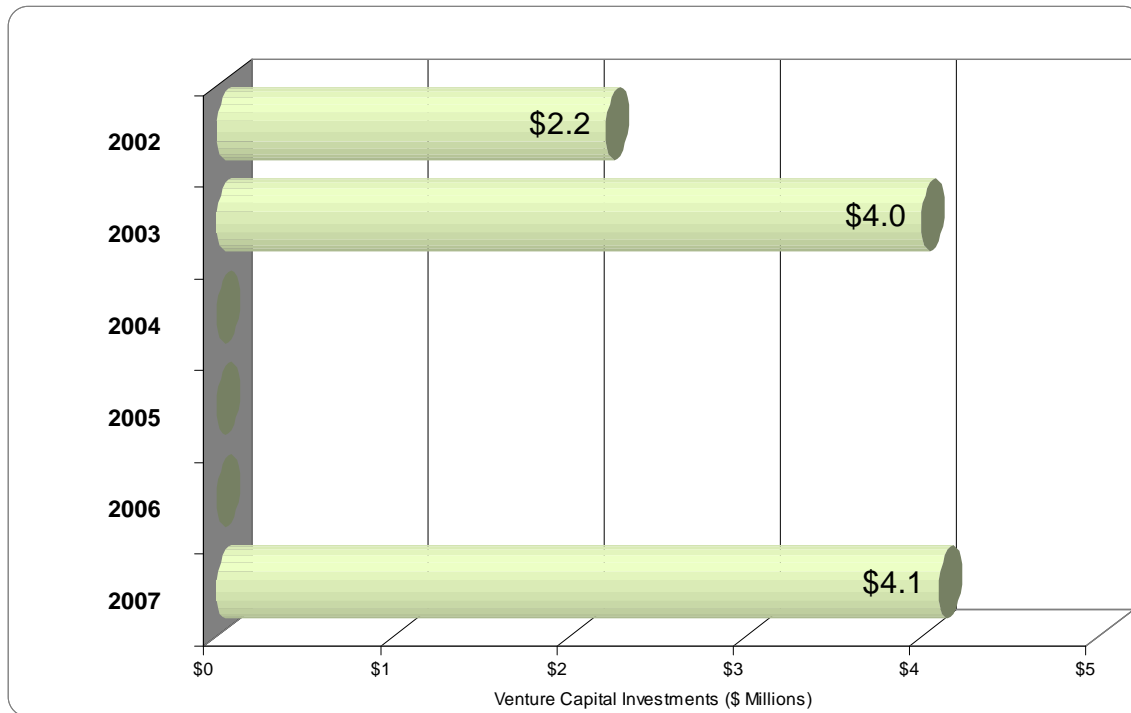


### Bioscience-related Degrees in Vermont, AY 2006

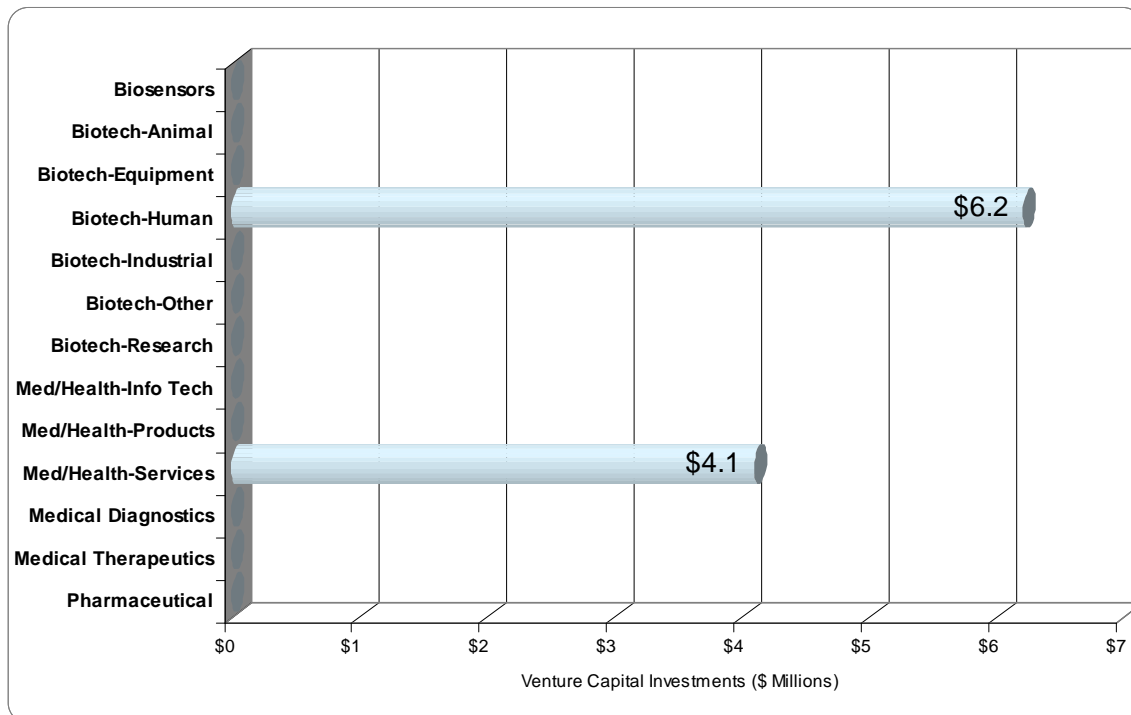


## Bioscience Venture Capital

### Bioscience-related Venture Capital Investments in Vermont, 2002–2007

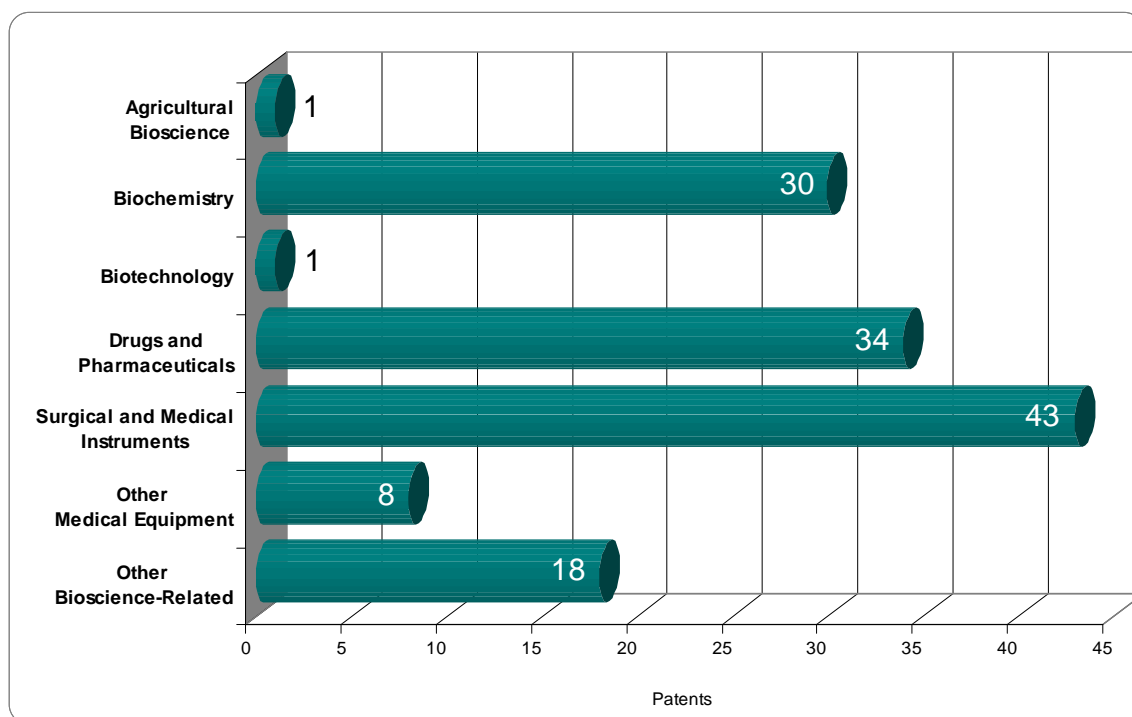


### Bioscience-related Venture Capital Investments in Vermont by Segment, 2002–2007



## Bioscience Patents

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



## State Bioscience Contacts

### State Agency Contact:

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### 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 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.