BIOSCIENCE 08

# MARYLAND

Maryland's largest and most specialized bioscience subsector (location quotient of 2.00) is research, testing, and medical laboratories. In drugs and pharmaceuticals, the state experienced rapid job growth in recent years (up 15 percent). Academic bioscience research expenditures of $1.3 billion in 2006 were dominated by medical sciences ($863 million); and, over 2002–2006, the growth rate exceeded the national average. Across three key metrics—bioscience research funding, bioscience venture capital investments, and bioscience patents—Maryland places in the top 10 states nationally. In the past 6 years, the State had $1.96 billion in venture capital investments, mainly in the pharmaceutical and human biotechnology sectors. Biochemistry was the largest single patent category, followed by drugs and pharmaceuticals.

**Major Industry Developments and Recent Successes**

- In July 2007, Maryland-based Digene was acquired by Qiagen for $1.6 billion. Qiagen will maintain its U.S. headquarters in Maryland and expects to hire an additional 230 employees at the Maryland location.
- MedImmune Inc. broke ground to expand its biologics manufacturing facility in Maryland. The $250 million expansion is the first phase of a multiphase construction project. In April 2007, MedImmune was acquired by AstraZeneca for $15.2 billon, giving the British-based company entry into the vaccines market and creating a leading fully integrated biologics and vaccine business.
- Alba Therapeutics, a Baltimore-based start-up company based at the University of Maryland Biopark, signed a $325 million licensing deal with Shire, a global specialty-based biopharmaceutical company.

## Recent State Initiatives

Legislation was passed in 2007 and signed by Governor Martin O'Malley creating the **Maryland Life Sciences Advisory Board (LSAB)**. The 15-member Board includes senior officials from life science companies, the state's institutions of higher education, and federal laboratories with life science missions. LSAB is responsible for promoting life sciences research, development, commercialization, and manufacturing in Maryland and making recommendations to address critical needs in the life sciences, including access to venture capital and capital construction funding. In the summer of 2008, LSAB will submit to the Governor a strategic plan to further Maryland's position in the life sciences.

The **Maryland Stem Cell Research Fund**, which was created by the Maryland Stem Cell Research Act passed in 2006, has conducted two rounds of funding. The Fund received $15 million in FY 2007 and $23 million in FY 2008. Approximately $13 million had been awarded in grants by the end of 2007. In addition to funding research, the Fund has created a fellowship program that makes awards to predoctoral students and postdoctoral fellows who wish to conduct research on human stem cells in Maryland.

The **Tech Start Program**, funded at $150,000 in FY 2007, is designed to encourage the creation of more start-up companies based on university-developed technologies. The program funds further evaluation of technologies identified by university tech transfer offices as having potential for commercialization.

To meet the need for bioscience talent, the University of Maryland at College Park has created a new **Department of Bioengineering**.

The University of Maryland at College Park and the University of Maryland at Baltimore created a joint **Seed Grant Program** in 2006 for collaborative bioscience research between the institutions that

would lead to more competitive proposals for National Institutes of Health funding. In October 2007, the program was initially funded with $450,000. The 2008 program will be funded with a minimum of $600,000.

For additional information on Maryland's bioscience policies and programs, please see http://www.marylandtedco.org, http://www.choosemaryland.org, and http://www.techcouncilmd.com/mdbio.

## Bioscience Industry Base, 2006

| Industry Subsector | Maryland | | United States | |
|---|---|---|---|---|
| | 2006 | 2001–06 Change | 2006 | 2001–06 Change |
| Agricultural Feedstock & Chemicals | | | | |
| Establishments | 19 | -10.2% | 2,183 | 3.8% |
| Employment | 381 | -34.6% | 105,846 | -6.1% |
| Location Quotient | 0.20 | | n.a. | |
| Direct-Effect Employment Multiplier | 4.37 | | 11.22 | |
| Total Employment Impact | 1,662 | | 1,214,709 | |
| Average Annual Wage | $61,589 | | $67,870 | |
| Drugs & Pharmaceuticals | | | | |
| Establishments | 62 | -8.8% | 2,654 | 1.9% |
| Employment | 5,536 | 15.3% | 317,149 | 4.0% |
| Location Quotient | 0.95 | | n.a. | |
| Direct-Effect Employment Multiplier | 5.18 | | 9.92 | |
| Total Employment Impact | 28,666 | | 2,880,242 | |
| Average Annual Wage | $81,020 | | $86,892 | |
| Medical Devices & Equipment | | | | |
| Establishments | 233 | -7.7% | 15,215 | 0.3% |
| Employment | 3,080 | 2.7% | 422,993 | -0.9% |
| Location Quotient | 0.40 | | n.a. | |
| Direct-Effect Employment Multiplier | 2.84 | | 4.85 | |
| Total Employment Impact | 8,746 | | 1,980,128 | |
| Average Annual Wage | $53,888 | | $59,441 | |
| Research, Testing, & Medical Laboratories | | | | |
| Establishments | 714 | 31.3% | 22,857 | 32.7% |
| Employment | 16,457 | 18.9% | 449,991 | 17.8% |
| Location Quotient | 2.00 | | n.a. | |
| Direct-Effect Employment Multiplier | 2.38 | | 3.25 | |
| Total Employment Impact | 39,174 | | 1,440,500 | |
| Average Annual Wage | $75,502 | | $71,284 | |
| Total Private Sector | | | | |
| Establishments | 159,421 | 9.9% | 8,575,730 | 10.2% |
| Employment | 2,074,418 | 4.8% | 113,463,842 | 3.1% |
| Average Annual Wage | $44,527 | | $42,272 | |

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

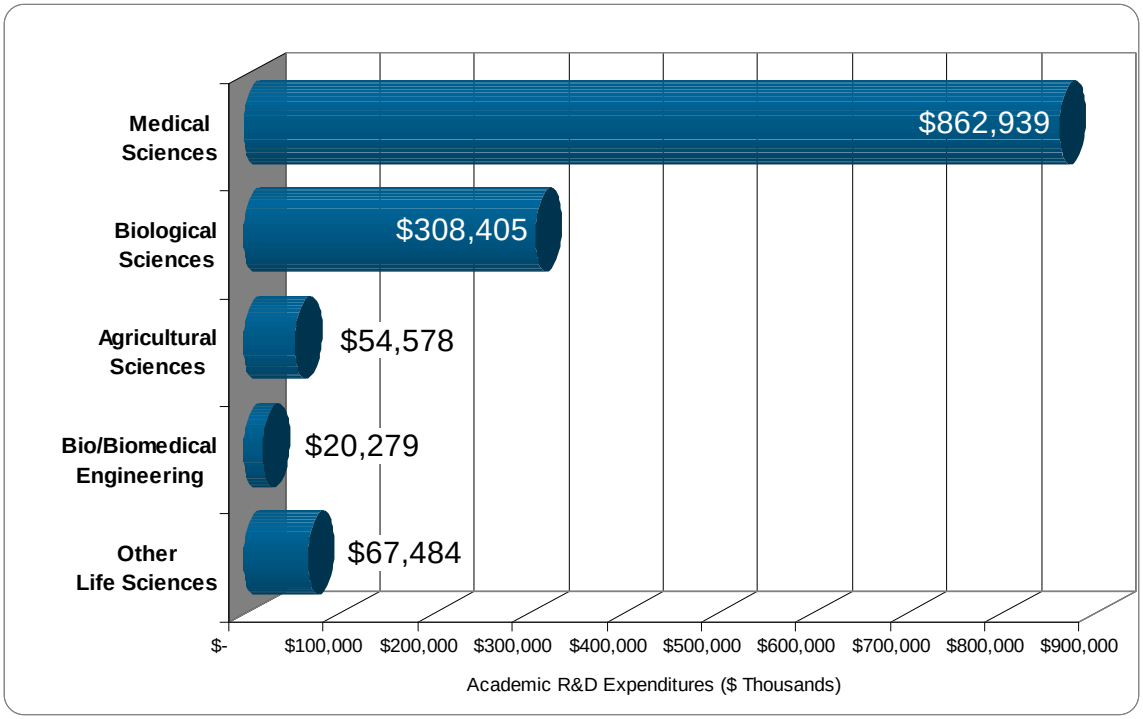
## Additional Bioscience Performance Metrics

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

| | Maryland | United States | Rank |
|---|---|---|---|
| Academic R&D Expenditures, FY 2006 | | | |
| Total ($ thousands) | $2,530,231 | $47,760,402 | 4 |
| Bioscience R&D ($ thousands) | $1,313,685 | $29,307,628 | 5 |
| Bioscience Share of Total R&D | 51.9% | 61.4% | |
| Bioscience R&D Per Capita | $234.50 | $98.10 | |
| Change in Bioscience R&D FY 2002–2006 | 49.7% | 36.9% | |
| NIH Funding, FY 2007 | | | |
| Total ($ thousands) | $976,541 | $21,066,389 | 6 |
| Per Capita Funding | $173.81 | $69.84 | |
| Change in Funding, FY 2002–2007 | -10.2% | 11.2% | |
| Higher Education Degrees in Bioscience Fields, AY 2006 | 2,693 | 143,433 | 17 |
| Employment in Bioscience-related Occupations, 2006 | 18,250 | 588,520 | 11 |
| Bioscience Venture Capital Investments, 2002-2007 ($ millions) | $1,956.7 | $51,260.9 | 5 |
| Bioscience and Related Patents, 2002-2007 | 3,680 | 121,817 | 7 |

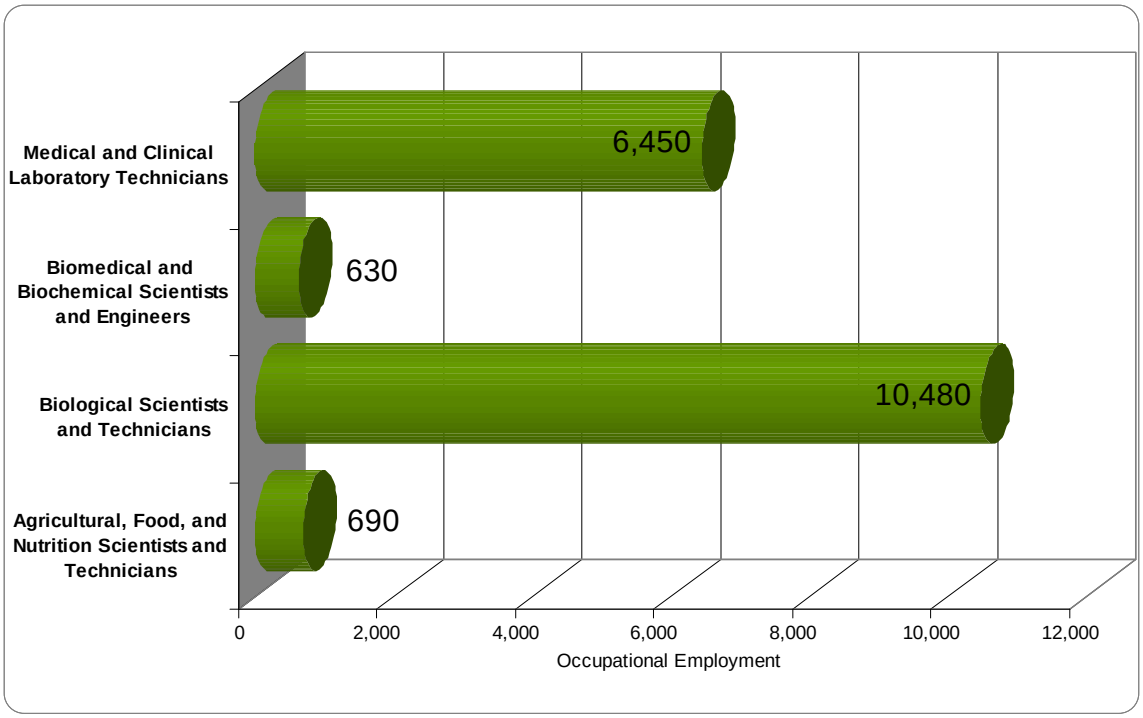
## Bioscience R&D Base

**Bioscience Academic R&D Expenditures in Maryland, FY 2006**

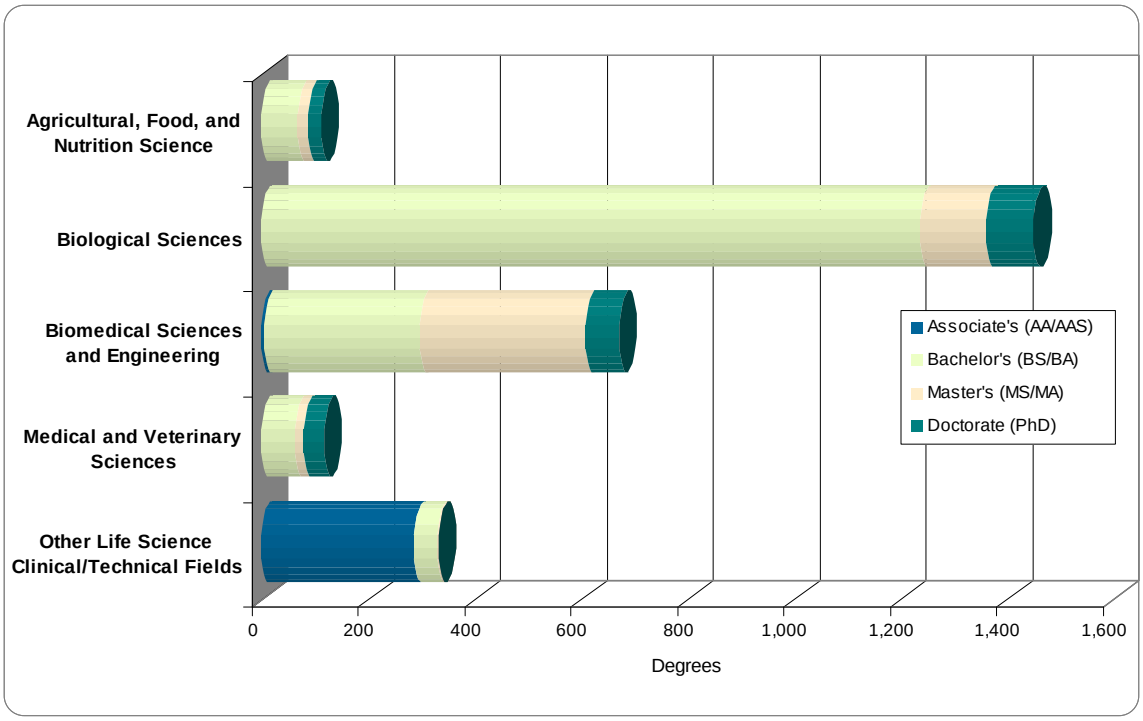


## Bioscience Talent Base

**Bioscience-related Occupational Employment in Maryland, 2006**

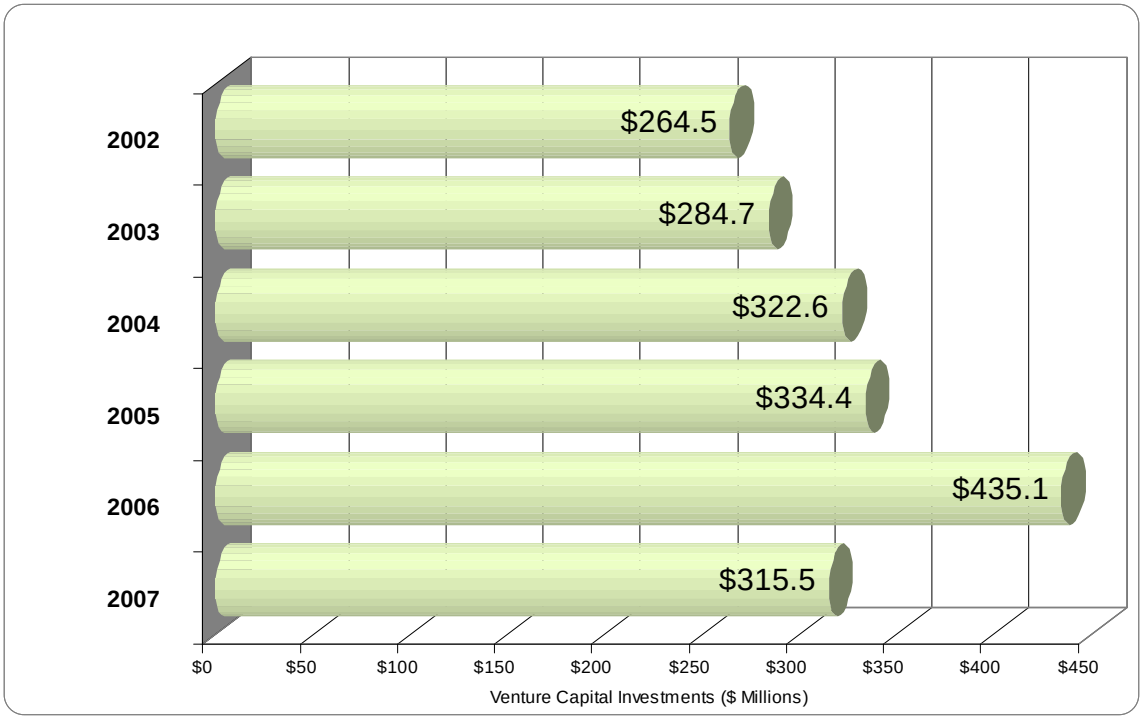



**Bioscience-related Degrees in Maryland, AY 2006**

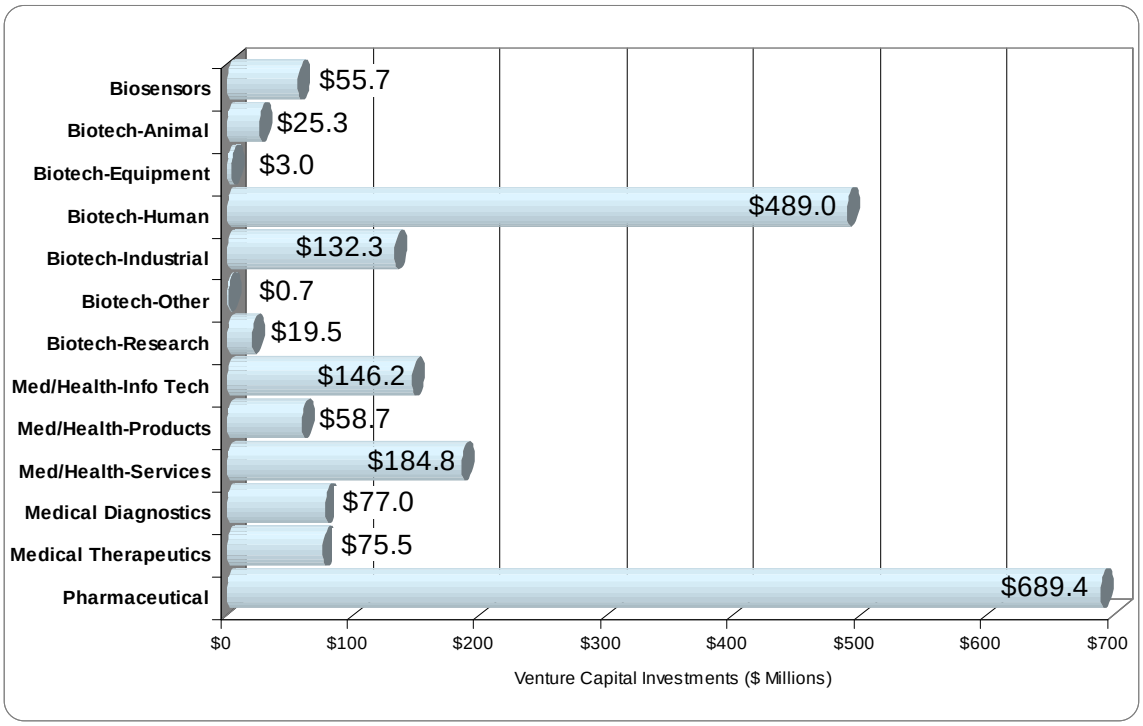


## Bioscience Venture Capital

**Bioscience-related Venture Capital Investments in Maryland, 2002–2007**

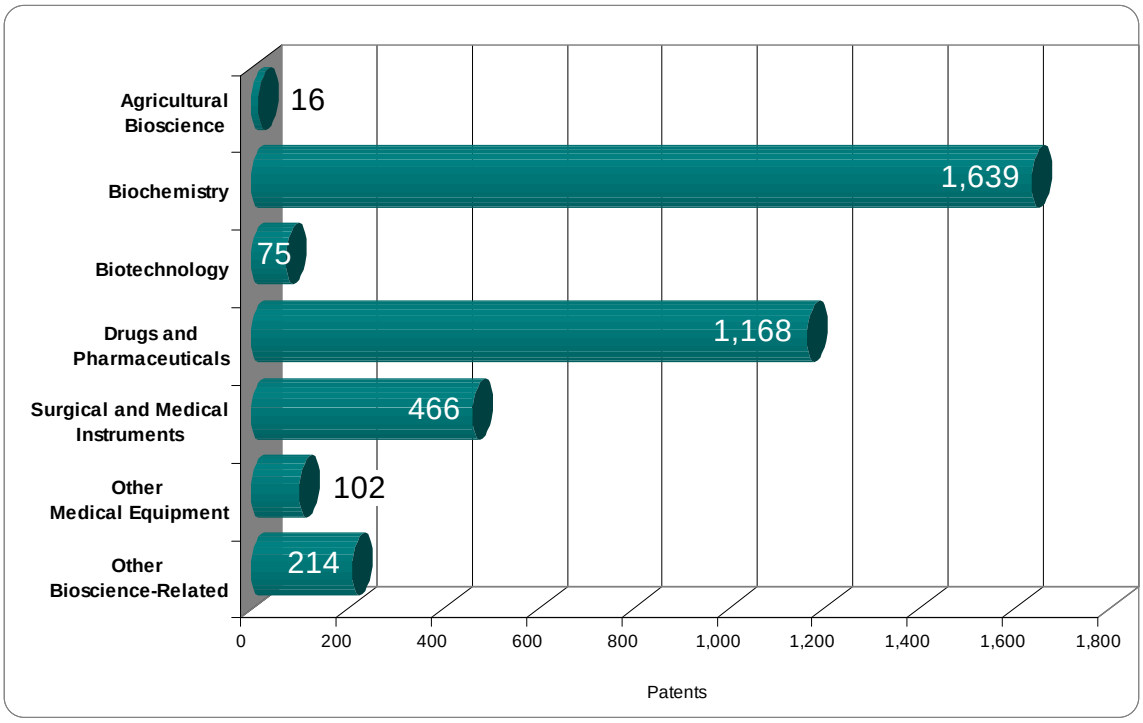



**Bioscience-related Venture Capital Investments in Maryland by Segment, 2002–2007**



## Bioscience Patents

**Bioscience-related Patents by Classification Group in Maryland, 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.