



The bioscience industry in Virginia employed more than 24,000 across nearly 1,900 business establishments in 2016. The research, testing and medical laboratories subsector accounts for 50 percent of all bioscience jobs in the state. Since 2014, small employment gains in the industry were driven by the medical device and equipment subsector, which grew four times faster in Virginia than the national average. State employers have grown the number of bioscience business establishments at a rate more than twice as fast as the nation between 2014 and 2016. Virginia's research universities spent nearly \$737 million in bioscience-related R&D activities in 2016. Bolstering this academic R&D, NIH funding in the state has grown by more than one-third in recent years, from \$280 million in 2014 to \$377 million in 2017.

## Bioscience Performance Metrics

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

Metric	Virginia	United States	Quintile
<b>Bioscience Industry, 2016</b>			
Bioscience Industry Employment	24,163	1,743,639	III
Bioscience Industry Location Quotient	0.55	n/a	IV
Bioscience Industry Establishments	1,897	85,702	II
<b>Academic Bioscience R&amp;D Expenditures, FY 2016</b>			
Bioscience R&D (\$ thousands)	\$736,660	\$41,972,205	II
Bioscience Share of Total R&D	54%	62%	III
Bioscience R&D Per Capita	\$88	\$130	IV
<b>NIH Funding, FY 2017</b>			
Funding (\$ thousands)	\$376,960	\$26,150,485	II
Funding Per Capita	\$45	\$80	III
<b>Bioscience Venture Capital Investments, 2014-17 (\$ millions)</b>	\$305.01	\$66,168.62	II
<b>Bioscience and Related Patents, 2014-17</b>	1,574	102,862	III

State ranking figures for bioscience performance metrics are calculated as quintiles, where I = top quintile, III = middle quintile, and V = bottom quintile. For source notes, see end of State Profile.

Industry Subsector	Virginia		United States	
	2016	2014-2016 Change	2016	2014-2016 Change
<b>Agricultural Feedstock and Industrial Biosciences</b>				
Establishments	21	5.0%	1,709	-3.2%
Employment	237	-5.0%	68,027	-1.2%
Location Quotient	0.14		n/a	
Direct-Effect Employment Multiplier	3.23			
Total Employment Impact	765			
Average Annual Wage	\$60,509	11.4%	\$80,961	2.7%
<b>Bioscience-Related Distribution</b>				
Establishments	680	6.7%	39,149	3.8%
Employment	7,030	1.1%	469,640	3.7%
Location Quotient	0.59		n/a	
Direct-Effect Employment Multiplier	2.16			
Total Employment Impact	15,164			
Average Annual Wage	\$81,630	3.5%	\$93,677	2.7%
<b>Drugs and Pharmaceuticals</b>				
Establishments	70	37.3%	3,754	13.7%
Employment	2,512	-4.5%	299,113	2.0%
Location Quotient	0.33		n/a	
Direct-Effect Employment Multiplier	4.46			
Total Employment Impact	11,214			
Average Annual Wage	\$86,581	-14.9%	\$113,815	-3.2%
<b>Medical Devices and Equipment</b>				
Establishments	184	31.4%	8,083	5.9%
Employment	2,415	11.8%	359,293	2.9%
Location Quotient	0.26		n/a	
Direct-Effect Employment Multiplier	2.59			
Total Employment Impact	6,245			
Average Annual Wage	\$71,555	3.8%	\$84,746	6.5%
<b>Research, Testing and Medical Laboratories</b>				
Establishments	942	18.5%	33,007	13.1%
Employment	11,969	-0.8%	547,566	8.2%
Location Quotient	0.86		n/a	
Direct-Effect Employment Multiplier	2.10			
Total Employment Impact	25,094			
Average Annual Wage	\$80,307	-0.1%	\$106,942	5.5%
<b>Total Bioscience Industry</b>				
Establishments	1,897	15.5%	85,702	7.7%
Employment	24,163	0.4%	1,743,639	4.4%
Location Quotient	0.54		n/a	
Direct-Effect Employment Multiplier	2.42			
Total Employment Impact	58,481			
Average Annual Wage	\$80,275	-0.9%	\$98,961	3.1%
<b>Total Private Sector</b>				
Establishments	249,760	9.5%	9,243,034	3.4%
Employment	3,079,582	3.9%	120,884,570	4.2%
Average Annual Wage	\$54,342	3.4%	\$53,354	4.3%

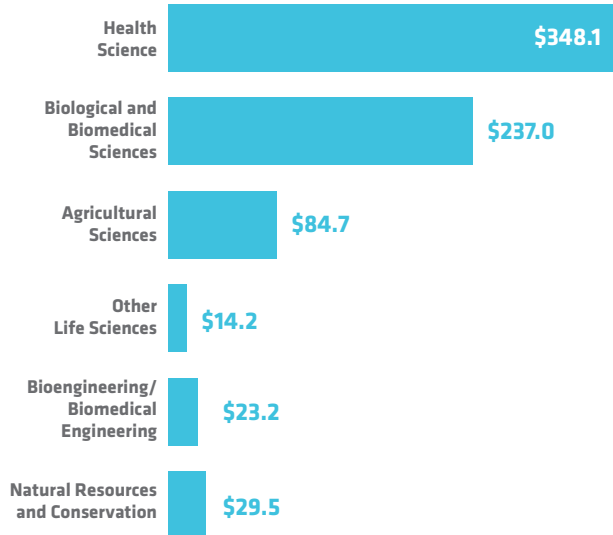
Note: U.S. employment metrics include Puerto Rico.

## Bioscience Research in Virginia

### Bioscience Academic R&D Expenditures

\$ Millions

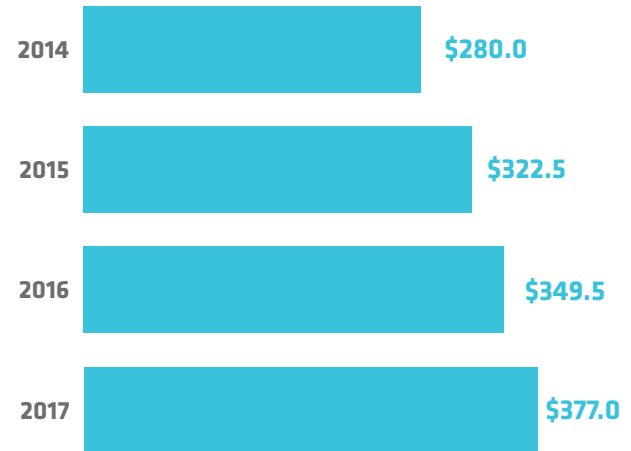
FY 2016



### NIH Awards

\$ Millions

FY 2014-2017

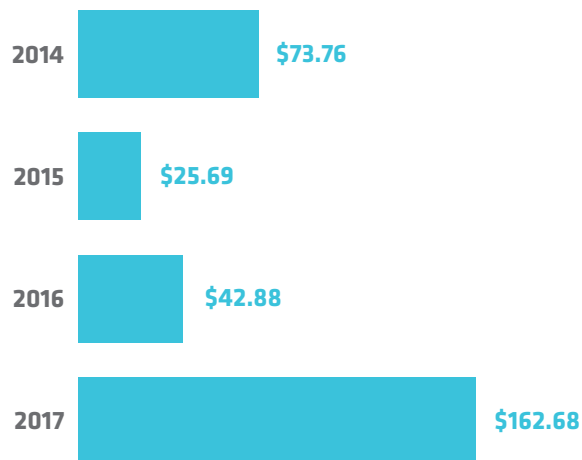


## Bioscience Venture Capital in Virginia

### Bioscience-Related Venture Capital Investments

\$ Millions

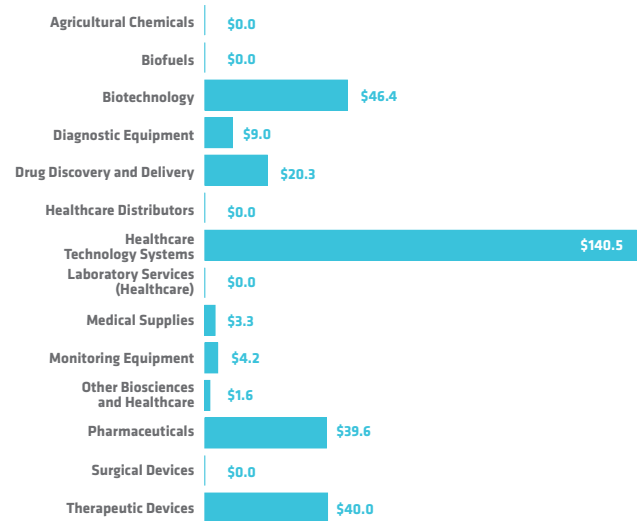
2014-2017



### Bioscience-Related Venture Capital Investments by Segment

\$ Millions

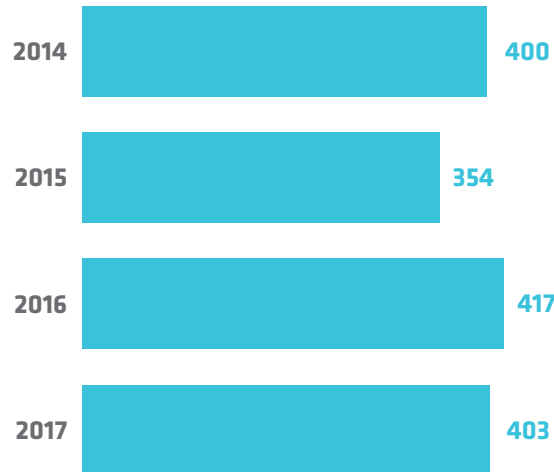
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## Bioscience Patents in Virginia

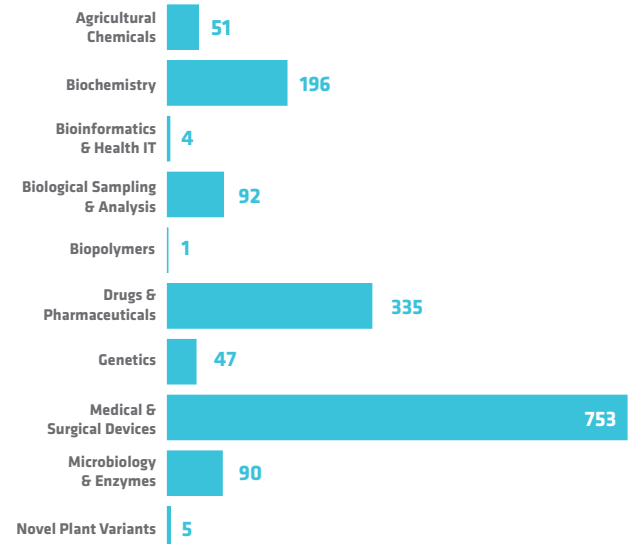
Bioscience-Related U.S. Patents

2014-2017



Bioscience-Related U.S. Patents by Segment

2014-2017



### Source Notes

**Employment, Establishments and Wages:** U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), enhanced file from IMPLAN.

**Employment Multipliers:** IMPLAN state-level Input/Output models.

**Academic R&D Expenditures:** National Science Foundation (NSF) Higher Education Research and Development (HERD) Survey.

**NIH Funding:** National Institutes of Health, NIH Awards by Location & Organization (summary information within RePORT database).

**Venture Capital:** PitchBook Data, Inc.

**Patents:** U.S. Patent & Trademark Office data from Clarivate Analytics' Derwent Innovation patent analysis database. For a more detailed discussion of the data and methodology used, please see the Appendix to the full national report.