



Tennessee’s bioscience firms have grown their employment base by 2.4 percent since 2014 and employed nearly 34,000 in 2016. Companies have also expanded their establishment count by nearly 26 percent during this same period and now operate 1,547 across the state. Three of the five major industry subsectors in the state have increased employment during the 2-year period. Tennessee has a specialized employment concentration in bioscience-related distribution, 43 percent more concentrated than the national average (location quotient is 1.43). In addition, Tennessee has a well above-average concentration in medical device manufacturing. Tennessee’s research universities conducted more than \$705 million in bioscience-related academic R&D in 2016; funded, in part, by a growing base of NIH awards that reached \$511 million in FY 2017.

## Bioscience Performance Metrics

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

Metric	Tennessee	United States	Quintile
<b>Bioscience Industry, 2016</b>			
Bioscience Industry Employment	33,907	1,743,639	II
Bioscience Industry Location Quotient	0.95	n/a	II
Bioscience Industry Establishments	1,547	85,702	II
<b>Academic Bioscience R&amp;D Expenditures, FY 2016</b>			
Bioscience R&D (\$ thousands)	\$705,526	\$41,972,205	II
Bioscience Share of Total R&D	68%	62%	II
Bioscience R&D Per Capita	\$106	\$130	III
<b>NIH Funding, FY 2017</b>			
Funding (\$ thousands)	\$511,448	\$26,150,485	II
Funding Per Capita	\$76	\$80	II
<b>Bioscience Venture Capital Investments, 2014-17 (\$ millions)</b>	\$292.25	\$66,168.62	III
<b>Bioscience and Related Patents, 2014-17</b>	1,888	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	Tennessee		United States	
	2016	2014-2016 Change	2016	2014-2016 Change
<b>Agricultural Feedstock and Industrial Biosciences</b>				
Establishments	23	-17.9%	1,709	-3.2%
Employment	1,274	-14.1%	68,027	-1.2%
Location Quotient	0.91		n/a	
Direct-Effect Employment Multiplier	10.11			
Total Employment Impact	12,875			
Average Annual Wage	\$102,159	11.6%	\$80,961	2.7%
<b>Bioscience-Related Distribution</b>				
Establishments	871	28.9%	39,149	3.8%
Employment	13,739	-4.5%	469,640	3.7%
Location Quotient	1.43		n/a	
Direct-Effect Employment Multiplier	2.26			
Total Employment Impact	31,012			
Average Annual Wage	\$83,527	8.5%	\$93,677	2.7%
<b>Drugs and Pharmaceuticals</b>				
Establishments	48	37.1%	3,754	13.7%
Employment	2,339	29.3%	299,113	2.0%
Location Quotient	0.38		n/a	
Direct-Effect Employment Multiplier	5.71			
Total Employment Impact	13,346			
Average Annual Wage	\$82,145	-7.4%	\$113,815	-3.2%
<b>Medical Devices and Equipment</b>				
Establishments	138	21.1%	8,083	5.9%
Employment	8,541	6.3%	359,293	2.9%
Location Quotient	1.16		n/a	
Direct-Effect Employment Multiplier	2.92			
Total Employment Impact	24,967			
Average Annual Wage	\$87,620	-1.2%	\$84,746	6.5%
<b>Research, Testing and Medical Laboratories</b>				
Establishments	467	23.4%	33,007	13.1%
Employment	8,014	8.4%	547,566	8.2%
Location Quotient	0.71		n/a	
Direct-Effect Employment Multiplier	2.08			
Total Employment Impact	16,678			
Average Annual Wage	\$73,396	-0.6%	\$106,942	5.5%
<b>Total Bioscience Industry</b>				
Establishments	1,547	25.6%	85,702	7.7%
Employment	33,907	2.4%	1,743,639	4.4%
Location Quotient	0.95		n/a	
Direct-Effect Employment Multiplier	2.92			
Total Employment Impact	98,877			
Average Annual Wage	\$82,768	2.9%	\$98,961	3.1%
<b>Total Private Sector</b>				
Establishments	148,812	4.7%	9,243,034	3.4%
Employment	2,478,830	5.8%	120,884,570	4.2%
Average Annual Wage	\$47,618	5.1%	\$53,354	4.3%

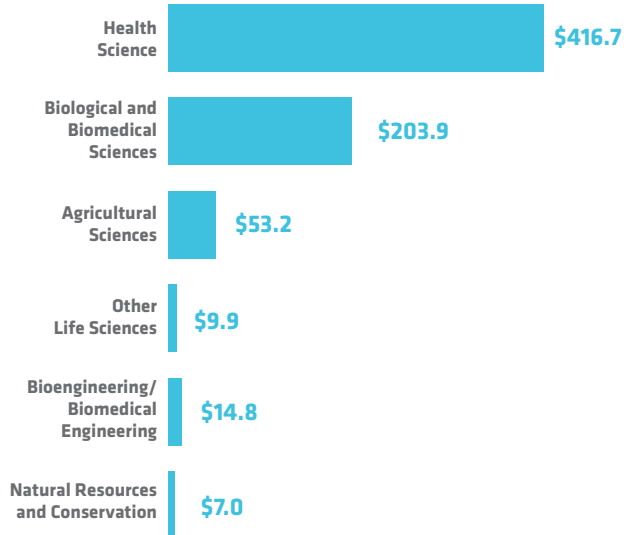
Note: U.S. employment metrics include Puerto Rico.

## Bioscience Research in Tennessee

### Bioscience Academic R&D Expenditures

\$ Millions

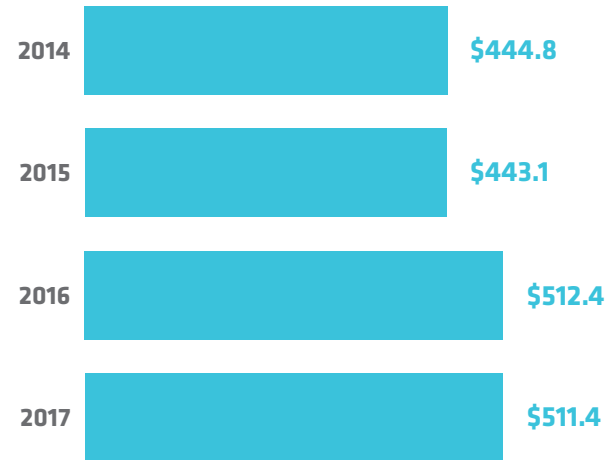
FY 2016



### NIH Awards

\$ Millions

FY 2014-2017

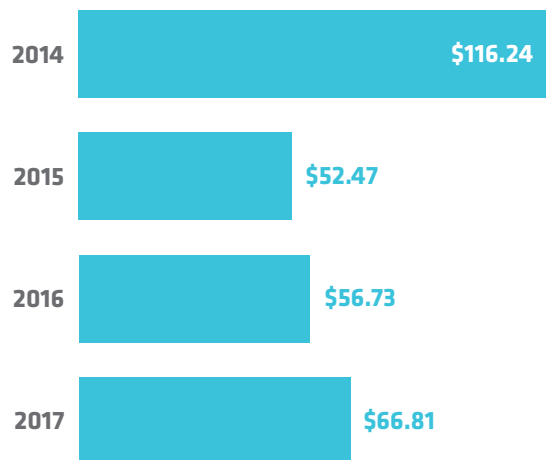


## Bioscience Venture Capital in Tennessee

### Bioscience-Related Venture Capital Investments

\$ Millions

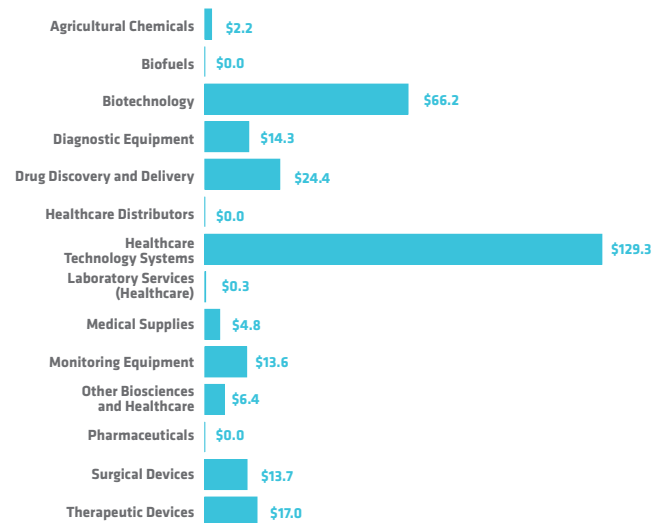
2014-2017



### Bioscience-Related Venture Capital Investments by Segment

\$ Millions

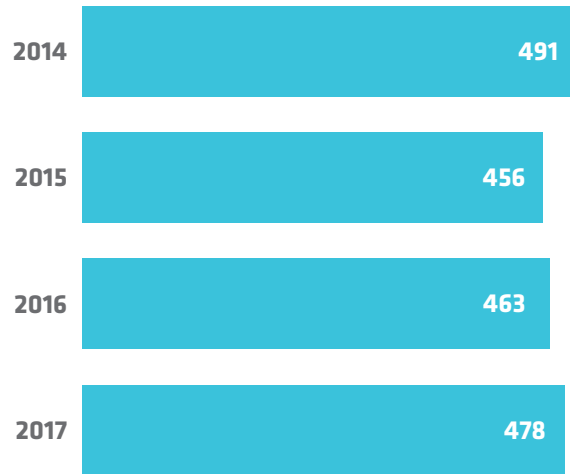
2014-2017



## Bioscience Patents in Tennessee

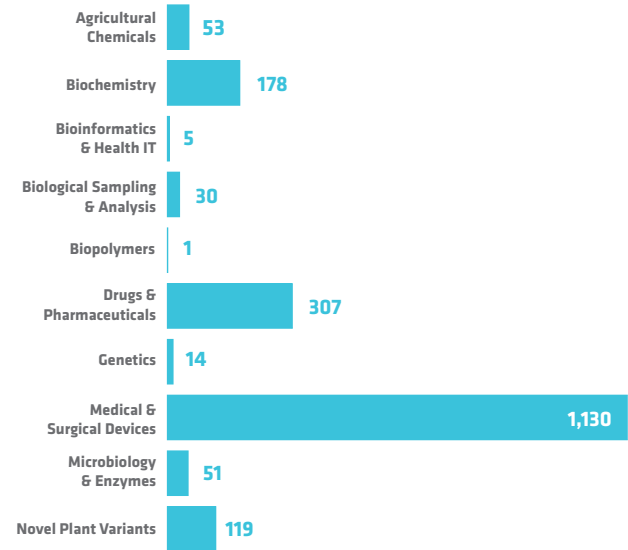
Bioscience-Related U.S. Patents

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.