



TEconomy/BIO

**The Value of Bioscience Innovation in Growing Jobs and Improving Quality of Life 2016**

**Tennessee**

Tennessee’s bioscience industry is sizable and specialized in its concentration with more than 40,000 jobs that spanned 1,275 business establishments in 2014. Tennessee has a specialized employment concentration in the biosciences overall with a 21 percent greater concentration of jobs in the industry relative to the national average. Within the state’s bioscience industry, two of its five subsectors are specialized in their concentrations—agricultural feedstock and chemicals and bioscience-related distribution. While overall employment has been flat since 2012, three subsectors have added jobs during this period. Tennessee’s research universities are especially focused in the biosciences relative to other fields with their \$750 million in bioscience academic R&D in 2014 accounting for 69 percent of all academic research compared with 61 percent for the national average.

**Bioscience Performance Metrics**

Summary of State Performance in Selected Bioscience-related Metrics

Metric	Tennessee	United States	Quintile
<b>Bioscience Industry, 2014</b>			
Bioscience Industry Employment	40,402	1,655,680	II
Bioscience Industry Location Quotient	1.21	n/a	II
Bioscience Industry Establishments	1,275	77,283	III
<b>Academic Bioscience R&amp;D Expenditures, FY 2014</b>			
Bioscience R&D (\$ thousands)	\$750,076	\$38,873,926	II
Bioscience Share of Total R&D	69%	61%	II
Bioscience R&D Per Capita	\$115	\$122	II
<b>NIH Funding, FY 2015</b>			
Funding (\$ thousands)	\$443,117	\$22,869,746	II
Funding Per Capita	\$67	\$71	II
<b>Bioscience Venture Capital Investments, 2012–15 (\$ millions)</b>	\$402.8	\$48,742.10	II
<b>Bioscience and Related Patents, 2012–15</b>	1,875	101,026	II

State ranking figures for bioscience performance metrics are calculated as quintiles, where:

top quintile – I II III IV V – bottom quintile

For source notes, see end of State Profile.



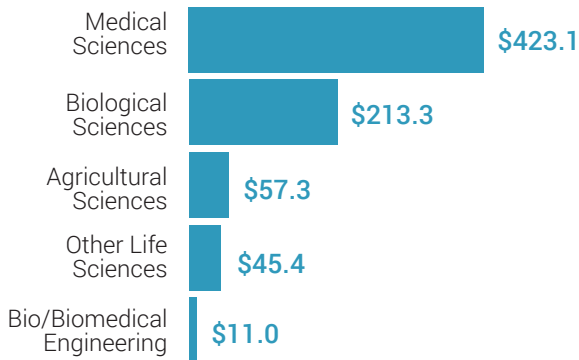
Industry Subsector	Tennessee		United States	
	2014	2012–2014 Change	2014	2012–2014 Change
<b>Agricultural Feedstock and Chemicals</b>				
Establishments	33	8.8%	1,811	2.2%
Employment	5,634	0.5%	77,545	1.5%
Location Quotient	3.60		n/a	
Direct-Effect Employment Multiplier	16.3		18.4	
Total Employment Impact	91,746		1,432,125	
Average Annual Wage	\$104,188	5.9%	\$80,640	6.3%
<b>Bioscience-Related Distribution</b>				
Establishments	734	-5.9%	37,833	2.8%
Employment	15,658	-5.2%	452,325	2.3%
Location Quotient	1.71		n/a	
Direct-Effect Employment Multiplier	3.0		3.0	
Total Employment Impact	46,779		1,358,820	
Average Annual Wage	\$76,900	3.0%	\$90,458	6.2%
<b>Drugs and Pharmaceuticals</b>				
Establishments	35	9.4%	3,301	8.0%
Employment	1,809	-1.6%	293,353	3.2%
Location Quotient	0.31		n/a	
Direct-Effect Employment Multiplier	11.4		11.0	
Total Employment Impact	20,582		3,242,627	
Average Annual Wage	\$88,666	-5.6%	\$117,524	10.3%
<b>Medical Devices and Equipment</b>				
Establishments	114	9.6%	7,636	5.5%
Employment	8,034	6.4%	349,045	-0.1%
Location Quotient	1.14		n/a	
Direct-Effect Employment Multiplier	4.6		4.6	
Total Employment Impact	37,311		1,596,802	
Average Annual Wage	\$88,712	13.6%	\$79,537	5.1%
<b>Research, Testing, and Medical Laboratories</b>				
Establishments	360	12.5%	26,702	10.2%
Employment	9,267	4.1%	483,412	3.4%
Location Quotient	0.95		n/a	
Direct-Effect Employment Multiplier	3.0		3.1	
Total Employment Impact	28,113		1,554,719	
Average Annual Wage	\$77,073	3.5%	\$97,485	6.8%
<b>Total Bioscience Industry</b>				
Establishments	1,275	0.7%	77,283	5.7%
Employment	40,402	0.0%	1,655,680	2.2%
Location Quotient	1.21		n/a	
Direct-Effect Employment Multiplier	5.2		5.5	
Total Employment Impact	209,296		9,185,094	
Average Annual Wage	\$83,620	5.3%	\$94,543	7.2%
<b>Total Private Sector</b>				
Establishments	142,191	3.6%	8,937,672	2.7%
Employment	2,342,343	4.5%	116,018,300	4.4%
Average Annual Wage	\$45,310	2.4%	\$51,148	4.3%

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



Bioscience Research in Tennessee

Bioscience Academic R&D Expenditures  
\$ Millions  
FY 2014



NIH Awards  
\$ Millions  
FY 2012-2015

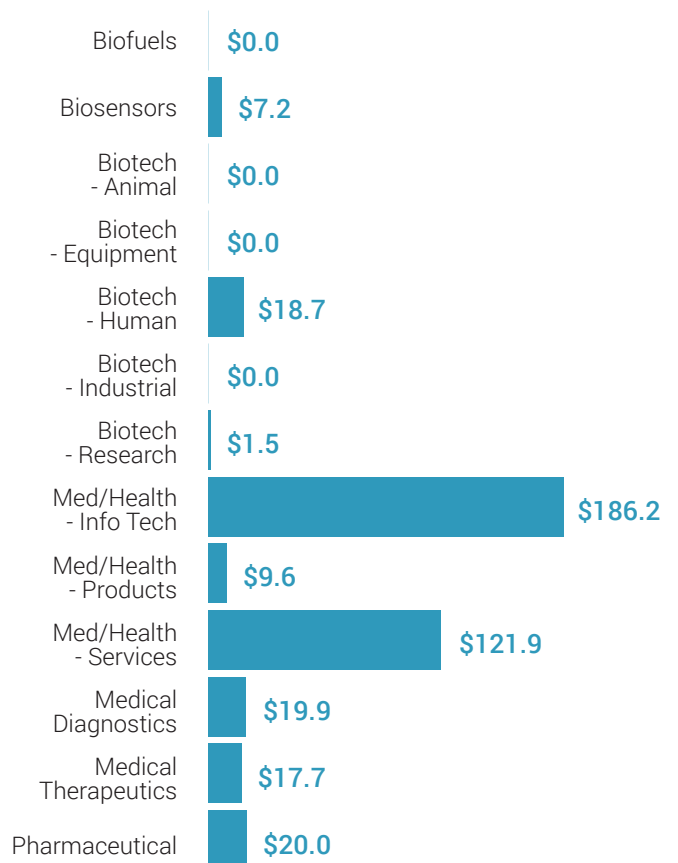


Bioscience Venture Capital in Tennessee

Bioscience-Related Venture  
Capital Investments  
\$ Millions  
2012-2015



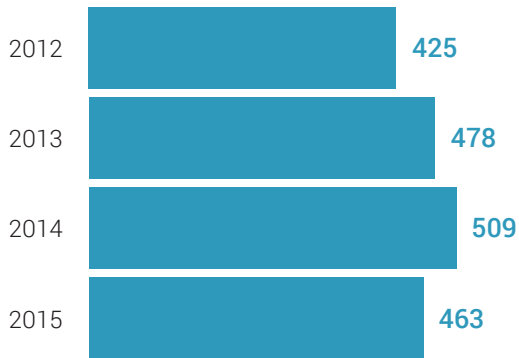
Bioscience-Related Venture  
Capital Investments by Segment  
\$ Millions  
2012-2015



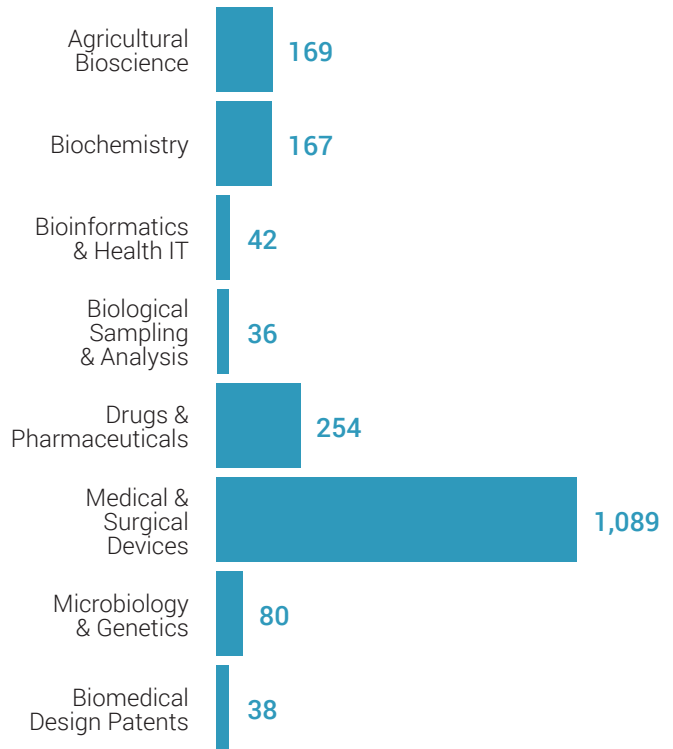


### Bioscience Patents in Tennessee

Bioscience-Related U.S. Patents 2012-2015



Bioscience-Related U.S. Patents by Segment 2012-2015



#### Source Notes

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

**Employment Multipliers:** IMPLAN Group, LLC 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:** Thomson Reuters Thomson ONE venture capital database.

**Patents:** U.S. Patent & Trademark Office data from Thomson Reuters Thomson Innovation patent analysis database.

For a more detailed discussion of the data and methodology used, please see the Appendix to the full national report.