

The U.S. Bioscience Industry: Fostering Innovation and Driving America's Economy Forward

Pennsylvania's bioscience industry is among the national leaders in its size, and state employers have grown their payrolls by 7 percent since 2018 to reach more than 93,000 jobs that span 3,123 business establishments. Four of the state's five bioscience industry subsectors contributed to the overall employment gains. The state's bioscience industry employment is highly concentrated, measuring 8 percent above the national average (location quotient is 1.08). The state has a specialized concentration in two subsectors—pharmaceuticals and research, testing, and medical labs. Pennsylvania is among the top tier of states in key measures of the biosciences innovation ecosystem including in academic R&D expenditures which exceeded \$3 billion in 2020; NIH funding to its institutions; venture capital investments; and in patents awarded to state inventors. Venture capital investments in Pennsylvania bioscience companies increased in 2021 and totaled nearly \$1.5 billion.

Bioscience Performance Metrics

Summary of State Performance in Selected Bioscience-related Metrics

Metric	Pennsylvania	United States	Quintile
Bioscience Industry, 2021			
Bioscience Industry Employment	93,105	2,135,704	1
Bioscience Industry Location Quotient	1.08	n/a	II
Bioscience Industry Establishments	3,123	127,389	П
Academic Bioscience R&D Expenditures, FY 2020			
Bioscience R&D (\$ thousands)	\$3,030,937	\$51,108,737	I
Bioscience Share of Total R&D	66%	63%	II
Bioscience R&D Per Capita	\$233	\$154	1
NIH Funding, FY 2021			
Funding (\$ thousands)	\$2,045,125	\$34,751,109	1
Funding Per Capita	\$158	\$105	I
Bioscience Venture Capital Investments, 2018-21 (\$ millions)	\$5,330.85	\$197,674.54	I
Bioscience-Related Patents, 2018-21	7,298	153,072	I

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.

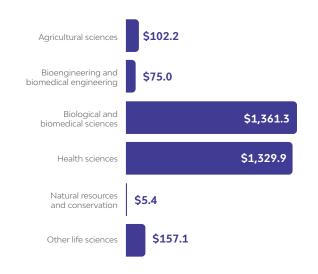
Establishments 38 7.0% 1,948 10 10 10 10 10 10 10 1	Industry Subsector		Pennsylvania			United States	
Agricultural Feedstock and Industrial Biosciences Establishments 38 7.0% 1,948 10 Beredstock and Industrial Biosciences Employment 876 7.3% 69,573 3 Biosciences Average Annual Wage \$73,269 10.8% \$91,989 12 Bioscience-Related Distribution Establishments 813 -3.4% 62,697 14 Bioscience-Related Distribution Employment 17,652 -6.8% 602,589 6 Average Annual Wage \$119,375 8.7% \$121,606 19 Establishments 281 6.1% 10,268 17 Medical Devices and Equipment 17,067 2.8% 398,847 9 Employment 1.06 n/a n/a Average Annual Wage \$78,146 6.9% \$98,481 8 Establishments 151 9.0% 5,973 34 Employment 20,317 12.5% 344,839 12 Location Quotient 1.45 n/a n/a			2021		2021	2018–2021 Change	
Feedstock and Industrial Biosciences Employment 876 7,3% 69,573 3 Average Annual Wage \$73,269 10.8% \$91,989 13 Bioscience-Related Distribution Employment 17,652 -6.8% 602,589 6 Medical Devices and Equipment Location Quotient 0.72 n/a 12,606 15 Medical Devices and Equipment Establishments 281 6.1% 10,268 17 Medical Devices and Equipment Employment 1.06 n/a 10,268 17 Medical Devices and Equipment Location Quotient 1.06 n/a 10,268 17 Medical Devices and Equipment Location Quotient 1.06 n/a 10,268 17 Medical Devices and Equipment Location Quotient 1.06 n/a 10,268 17 Medical Devices and Equipment 1.06 n/a 1,28 1,28 1,28 1,28 1,28 1,28 1,28 1,24 1,28 1,24 1,28 1,24 1,28 1,24 </td <td rowspan="4">Feedstock and Industrial</td> <td>Establishments</td> <td>38</td> <td>-</td> <td>1,948</td> <td>10.0%</td>	Feedstock and Industrial	Establishments	38	-	1,948	10.0%	
and Industrial Biosciences Location Quotient 0.51 n/a Average Annual Wage \$73,269 10.8% \$91,989 13 Bioscience-Related Distribution Employment 17,652 -6.8% 602,589 6 Related Distribution Location Quotient 0.72 n/a 14 Average Annual Wage \$119,375 8.7% \$121,606 15 Establishments 281 6.1% 10,268 17 Medical Devices and Equipment Employment 17,067 2.8% 398,847 5 Employment 1.06 n/a n/a n/a 1 Average Annual Wage \$78,146 6.9% \$98,481 8 1 Pharmaceuticals Establishments 151 9.0% 5,973 34 Employment 20,317 12.5% 344,839 12 Location Quotient 1.45 n/a 1 Average Annual Wage \$142,954 10.1% \$126,153 10 Research, Testing, and Med		Employment	876	7.3%	69,573	1.9%	
Average Annual Wage \$75,269 10.8% \$91,989 13 Establishments 813 -3.4% 62,697 14 Bioscience-Related Distribution 17,652 -6.8% 602,589 66 Related Distribution 17,652 -6.8% 602,589 66 Location Quotient 0.72 n/a Average Annual Wage \$119,375 8.7% \$121,606 15 Establishments 281 6.1% 10,268 17 Average Annual Wage \$17,067 2.8% 398,847 55 and Equipment 17,067 2.8% 398,847 55 and Equipment 1,06 n/a Average Annual Wage \$78,146 6.9% \$98,481 88 Establishments 151 9.0% 5,973 34 Employment 20,317 12.5% 344,839 12 Location Quotient 1.45 n/a Average Annual Wage \$142,954 10.1% \$126,153 10 Research, Testing, and Medical Laboratories Employment 1,28 n/a Average Annual Wage \$143,816 15.3% \$147,396 22 Establishments 3,123 18.0% 127,389 22 Total Bioscience Industry Location Quotient 1.08 n/a		Location Quotient	0.31		n/a		
Bioscience-Related Employment 17,652 -6.8% 602,589 602		Average Annual Wage	\$73,269	10.8%	\$91,989	13.1%	
Related Distribution Location Quotient 0.72 n/a Average Annual Wage \$119,375 8.7% \$121,606 15 Medical Devices and Equipment Establishments 281 6.1% 10,268 17 Medical Devices and Equipment Employment 17,067 2.8% 398,847 5 Location Quotient 1.06 n/a n/a n/a 1 Average Annual Wage \$78,146 6.9% \$98,481 8 8 Establishments 151 9.0% 5,973 34 12	Related	Establishments	813	-3.4%	62,697	14.7%	
Distribution Location Quotient Average Annual Wage \$119,375 8.7% \$121,606 15		Employment	17,652	-6.8%	602,589	6.6%	
Establishments 281 6.1% 10,268 17		Location Quotient	0.72		n/a		
Medical Devices and Equipment Employment 17,067 2.8% 398,847 5 Average Annual Wage \$78,146 6.9% \$98,481 8 Establishments 151 9.0% 5,973 34 Employment 20,317 12.5% 344,839 12 Location Quotient 1.45 n/a 12.5% 344,839 12 Average Annual Wage \$142,954 10.1% \$126,153 10 Research, Testing, and Medical Laboratories Employment 37,193 14.6% 719,856 19 Average Annual Wage \$143,816 15.3% \$147,396 22 Establishments 3,123 18.0% 127,389 22 Total Bioscience Industry Employment 93,105 7.2% 2,135,704 12		Average Annual Wage	\$119,375	8.7%	\$121,606	15.0%	
Average Annual Wage \$78,146 6.9% \$98,481 88	Medical Devices	Establishments	281	6.1%	10,268	17.4%	
Average Annual Wage \$78,146 6.9% \$98,481 88 Establishments 151 9.0% 5,973 34 Employment 20,317 12.5% 344,839 12 Location Quotient 1.45 n/a Average Annual Wage \$142,954 10.1% \$126,153 10 Establishments 1,841 34.5% 46,503 34 Research, Testing, and Medical Laboratories		Employment	17,067	2.8%	398,847	5.5%	
Establishments 151 9.0% 5,973 34	and Equipment	Location Quotient	1.06		n/a		
Pharmaceuticals Employment 20,317 12.5% 344,839 13 Location Quotient 1.45 n/a n/a n/a n/a Average Annual Wage \$142,954 10.1% \$126,153 10 Research, Testing, and Medical Laboratories Employment 37,193 14.6% 719,856 13 Average Annual Wage \$143,816 15.3% \$147,396 22 Establishments 3,123 18.0% 127,389 22 Total Bioscience Industry Employment 93,105 7.2% 2,135,704 13 Location Quotient 1.08 n/a n/a 12		Average Annual Wage	\$78,146	6.9%	\$98,481	8.7%	
Pharmaceuticals Location Quotient 1.45 n/a Average Annual Wage \$142,954 10.1% \$126,153 10 Research, Testing, and Medical Laboratories Employment 37,193 14.6% 719,856 19 Average Annual Wage \$143,816 15.3% \$147,396 22 Establishments 3,123 18.0% 127,389 22 Total Bioscience Industry Employment 93,105 7.2% 2,135,704 13 Location Quotient 1.08 n/a	Pharmaceuticals	Establishments	151	9.0%	5,973	34.7%	
Location Quotient 1.45 n/a Average Annual Wage \$142,954 10.1% \$126,153 10 Research, Testing, and Medical Laboratories Location Quotient 1.28 n/a Average Annual Wage \$143,816 15.3% \$147,396 22 Total Bioscience Industry Location Quotient 1.08 n/a Location Quotient 1.08 n/a		Employment	20,317	12.5%	344,839	11.9%	
Establishments 1,841 34.5% 46,503 348 34.5% 46,503 348 34.5% 34.5% 46,503 348 34.5%		Location Quotient	1.45		n/a		
Research, Testing, and Medical Laboratories Employment 37,193 14.6% 719,856 19 Average Annual Wage \$143,816 15.3% \$147,396 22 Establishments 3,123 18.0% 127,389 22 Total Bioscience Industry Employment 93,105 7.2% 2,135,704 12 Location Quotient 1.08 n/a n/a 12		Average Annual Wage	\$142,954	10.1%	\$126,153	10.3%	
Testing, and Medical Laboratories Location Quotient 1.28 n/a Average Annual Wage \$143,816 15.3% \$147,396 22 Total Bioscience Industry Employment 93,105 7.2% 2,135,704 12 Location Quotient 1.08 n/a 1.08 1.08 1.08	Testing, and Medical	Establishments	1,841	34.5%	46,503	34.5%	
Laboratories		Employment	37,193	14.6%	719,856	19.3%	
Average Annual Wage \$143,816 15.3% \$147,396 22 Establishments 3,123 18.0% 127,389 22 Total Bioscience Industry Employment 93,105 7.2% 2,135,704 12 Location Quotient 1.08 n/a		Location Quotient	1.28		n/a		
Total Bioscience Industry Employment 93,105 7.2% 2,135,704 12 Location Quotient 1.08 n/a		Average Annual Wage	\$143,816	15.3%	\$147,396	22.0%	
Industry Location Quotient 1.08 n/a		Establishments	3,123	18.0%	127,389	22.3%	
Location Quotient 1.00		Employment	93,105	7.2%	2,135,704	11.0%	
Average Annual Wage \$126,292 12.6% \$125,750 16		Location Quotient	1.08		n/a		
		Average Annual Wage	\$126,292	12.6%	\$125,750	16.4%	
Establishments 357,315 4.3% 10,665,643 9	Total Private Sector	Establishments	357,315	4.3%	10,665,643	9.3%	
Total Private Employment 4,997,664 -3.8% 123,376,557 -2		Employment	4,997,664	-3.8%	123,376,557	-1.5%	
Sector Location Quotient 1.00 n/a		Location Quotient	1.00		n/a		
Average Annual Wage \$64,750 17.1% \$67,826 18		Average Annual Wage	\$64,750	17.1%	\$67,826	18.9%	

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

Bioscience Research in Pennsylvania

Bioscience Academic R&D Expenditures

\$ Millions, FY 2020



NIH Awards

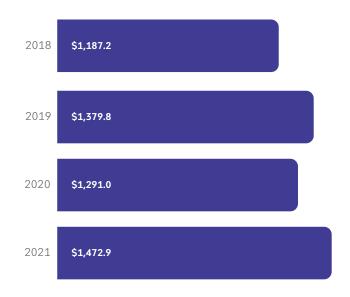
\$ Millions, FY 2018-2021



Bioscience Venture Capital in Pennsylvania

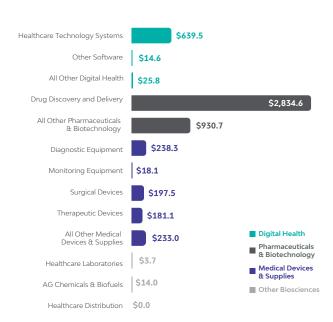
Bioscience-Related Venture Capital Investments

\$ Millions, 2018-2021



Bioscience-Related Venture Capital Investments by Segment

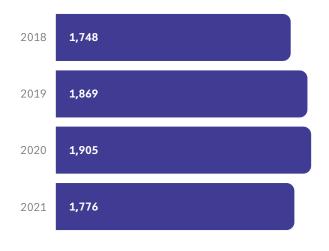
\$ Millions, 2018-2021



Bioscience Patents in Pennsylvania

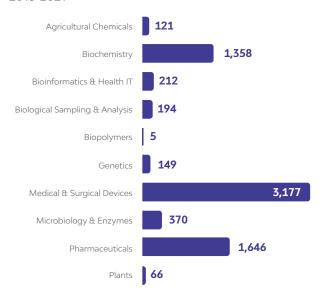
Bioscience-Related U.S. Patents

2018-2021



Bioscience-Related U.S. Patents by Segment

2018-2021



Source Notes

Employment, Establishments and Wages: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), enhanced by Lightcast (Datarun 2022.3).

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.



