



Pennsylvania Life Sciences Industry

June 2026

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Prepared for

Life Sciences Pennsylvania

Life Sciences Pennsylvania (LSPA) is the statewide trade association for the Commonwealth of Pennsylvania's (Commonwealth) life sciences industry. Founded in 1989, LSPA works to ensure Pennsylvania has a business and public policy climate that makes the Commonwealth the most attractive location to open and operate a life sciences company.

LSPA represents biotechnology, medical device, diagnostic, pharmaceutical, research, and investment entities, along with myriad service providers that support the industry. Together, LSPA unifies Pennsylvania's innovators to make the Commonwealth a global life sciences leader.

Prepared by:

KPMG

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Executive summary

Pennsylvania's life sciences industry is navigating a period of transformation, marked by economic uncertainty, the growing influence of new technologies, and shifting patterns in clinical research and workforce development priorities. Despite recent trends of modest growth, the life sciences industry's economic contribution to the Commonwealth has continued to rise, supported through leading academic education and research institutions and concentration of cell and gene therapy (CGT) activities. The industry's total economic contribution increased from \$105.6 billion in 2020 to nearly \$130 billion in 2024. Collectively, the major elements of Pennsylvania's life sciences ecosystem make a sizable contribution to state and regional economies.

The purpose of this Report is to summarize the contributions of the life sciences industry to Pennsylvania's economy by analyzing industry subsector growth and other socioeconomic indicators. The Report also compares Pennsylvania's life sciences industry's growth and development with that of peer states. The data represented in this Report, as listed in Table 8 of the Methodology appendix, is gathered from multiple sources, including government agencies, commercial databases, and industry stakeholder interviews. Data, spanning 2021 – 2025, was analyzed and reported to measure the contribution of the life sciences industry to Pennsylvania and peer state economies.

Some key findings from this Report include the following:

Pennsylvania Life Sciences Snapshot

- From 2021 to 2024,¹ the number of life sciences establishments² in Pennsylvania grew by a sizable 18 percent, the second highest growth rate among peer states and close behind the US average (19 percent).
- From 2021 through 2024, the research, testing & medical laboratories subsector recorded the largest growth in both employment and wages across all subsectors in Pennsylvania's life sciences industry.

The following states identified by LSPA represent Pennsylvania's peer states for the purpose of this Report:

- California
- Maryland
- Massachusetts
- New Jersey
- New York
- North Carolina
- Ohio

These states contain large life sciences industrial ecosystems that share some functional similarities, attract life sciences investment, and contain concentrations of human health research and innovation activity.

The life sciences industry encompasses several key subsectors, including:

1. Research, testing, and medical laboratories
2. Wholesale trade
3. Medical devices and equipment
4. Drugs and pharmaceuticals.

¹ The last full year for which data were available at the time of preparation of the Report.

² Establishments are defined as a single physical location at which business is conducted or where services or industrial operations are performed.

Research excellence

- In 2024, Pennsylvania received \$2.5 billion in combined federal grants from the National Institutes of Health (NIH) and the National Science Foundation (NSF), placing it in the middle of its peer group, consistent with previous years.
- Relative to these peers, Pennsylvania appears to be in a phase of intensive delivery of previously planned facilities and is actively bringing significant research space online, increasing its current new construction research space from roughly 24,000 square feet in 2021 to about 227,000 square feet in 2023.
- While the number of clinical trials saw a gradual decline from 2021 to 2024, the ecosystem continues to support a robust continuum of research. This includes everything from early-stage to post-approval trials, backed by significant sponsorship from both academic institutions and global pharmaceutical companies.

Economic contribution

- In 2024, the life sciences industry supported a total of 361,000 jobs, comprising 109,000 direct jobs and an additional 252,000 through indirect and induced contributions. The life sciences industry's total economic output reached almost \$130 billion with direct contributions of over \$73 billion.

Academic contribution

- Pennsylvania is home to two of the top-100 research universities, the University of Pennsylvania and the University of Pittsburgh, globally for life sciences and medicine. The Commonwealth consistently produced the third-largest number of life sciences graduates among its peer states from 2021 to 2024.

Attracting capital

- Following a national trend, venture capital investment in Pennsylvania has slowed since its 2021 peak, which multiple stakeholders in the field noted through their interviews, reaching approximately \$616 million in 2025 and ranking No.5 in the nation.
- Pennsylvania ranked fifth among all states in total venture capital transaction value for pharmaceuticals, biotechnology and life sciences, up from fourth overall in 2021.

The remainder of this report is broken down into different subject areas detailing the life sciences industry's impact on funding, research, economic contribution, and academia in Pennsylvania. An overview of recent trends evolving within Pennsylvania's life sciences industry is also discussed.

Life Sciences industry

The life sciences industry represents a dynamic and continuously evolving element of Pennsylvania's economy, as the application of new technologies and scientific discoveries reshape how organizations approach human health.

Amid the evolving landscape, there is no single, globally standardized definition of the industry. To capture various facets of the industry as it exists in Pennsylvania and other regions in the US, the definition used in this report relies upon industry definitions from the North American Industry Classification System (NAICS).³ Life sciences industries are defined as those that contribute significantly to innovation and the improvement of human health.

In this Report, the definition of the life sciences industry primarily encompasses NAICS codes with principal economic activities in human health–related services, biotechnology, pharmaceuticals, medical devices, and the broader development and application of new scientific technologies that advance or improve human health. Establishments in the life sciences are engaged in the entire cycle of creating products and therapies spanning research and development, manufacturing, and commercialization of products and services in these fields.⁴

Individual life sciences NAICS codes are further grouped into several broad categories, including drugs and pharmaceuticals; medical devices and equipment; research, testing and medical laboratories; and wholesale trade. The full list of NAICS codes used in the definition of life sciences for the purpose of this Report is in the Methodology appendix.

The life sciences definition relied upon in this Report also includes proportions of certain industries (e.g. higher education, and research and development) and proportions of agricultural industries that provide direct inputs into life sciences products, including development vaccines and other therapies. To more accurately reflect the full value chain, we attribute a fraction of the chicken egg production industry to this subsector. The specific assumptions and calculations used to derive this allocation are detailed in the Methodology appendix.

³ NAICS is the standard industrial classification system used by federal agencies for classifying businesses in the US. NAICS was developed by the Office of Management and Budget.

⁴ Source: The U.S. Bioscience Industry: A Powerful Engine for State Economies. Biotechnology Innovation Organization and Council of State Bioscience Associations, December 2025.

Pennsylvania Life Sciences snapshot

Pennsylvania’s life sciences industry serves as an engine of technological innovation and scientific research. The industry’s levels of investment, research spending, and purchases of intermediate goods contribute to job creation, output, and consumer spending throughout the state’s economy. Measuring from a stabilized, postpandemic baseline of 2021, the life sciences industry has shown modest growth through 2024, both nationwide and in Pennsylvania.

Location quotient

The life sciences industry continues to demonstrate an above average concentration of economic activity in Pennsylvania relative to the US, with an overall location quotient of 1.12 in 2024, down slightly from 1.14 in 2021. As shown in Table 1, the drugs and pharmaceuticals subsector stands out as the life sciences subsector with the greatest concentration of activity compared to other industry subsectors. Its share of regional employment is approximately 50 percent higher than the national average, underscoring the Commonwealth’s continued competitive advantage in this cluster. The research, testing & medical laboratories subsector also maintains a solid employment concentration, with a location quotient of 1.24. The medical devices and equipment subsector has a location quotient close to 1.0, indicating a level of employment concentration roughly in line with the national average, while the wholesale trade subsector has lower location quotient reflecting a comparatively smaller distribution footprint.

Table 1: Life Sciences location quotient analysis

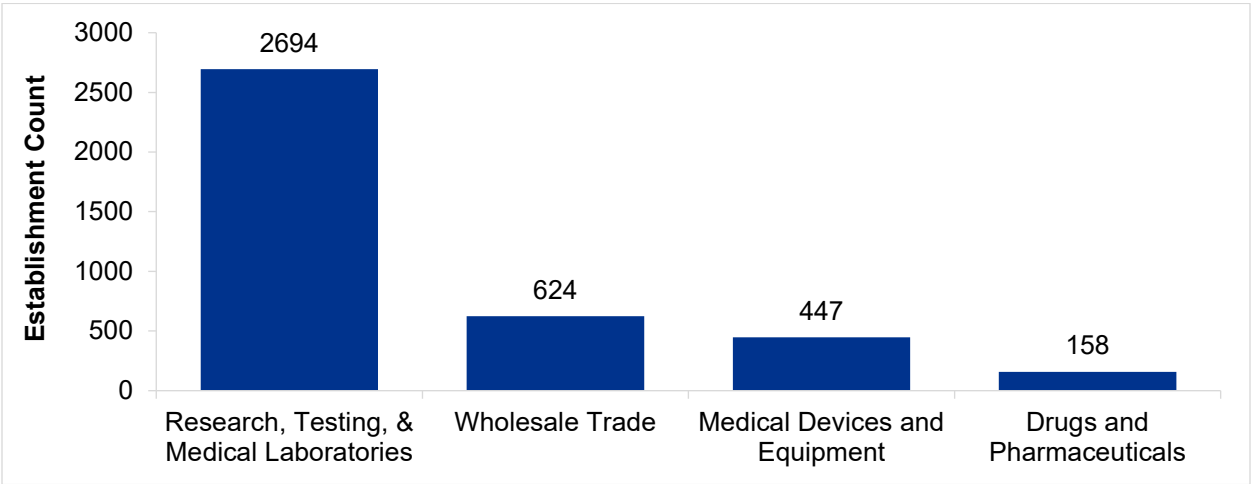
Industry (Subsector)	2021	2024
Drugs and pharmaceuticals	1.56	1.50
Medical devices and equipment	0.97	0.98
Research, testing, & medical laboratories	1.25	1.24
Wholesale trade	0.75	0.72
Life Sciences total	1.14	1.12

Sources: Quarterly Census of Employment and Wages (QCEW), Bureau of Labor Statistics (BLS), 2021 and 2024

Employment and establishment snapshot

Figure 1 shows the distribution of establishments by industry subsector, providing insight into the major life sciences specializations within Pennsylvania. The state’s life sciences industry is anchored by a large research, testing & medical laboratories base, which accounts for the greatest number of establishments among all subsectors. This extensive and specialized research footprint supports innovation, clinical development, and activities across the broader ecosystem. By contrast, the drugs and pharmaceuticals subsector has the smallest establishment count, consistent with a relatively greater concentration of employment among a few larger establishments as compared to other subsectors.

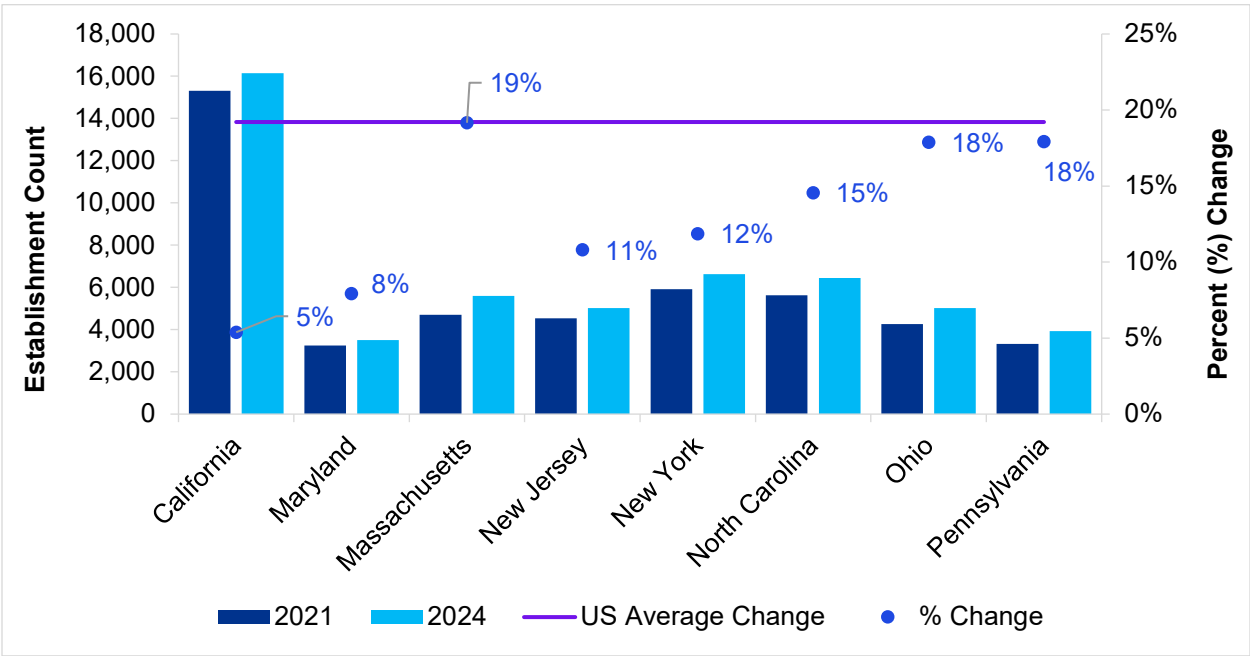
Figure 1: Life Sciences establishments in Pennsylvania by industry subsector in 2024



Sources: QCEW, BLS, 2024

When compared to peer states, Pennsylvania is expanding its life sciences footprint in line with the national average (Figure 2). From 2021 to 2024, the count of life sciences establishments in Pennsylvania grew by 18 percent from approximately 3,300 to approximately 3,900, the second-highest growth rate among peer states and close behind the US average (19 percent).

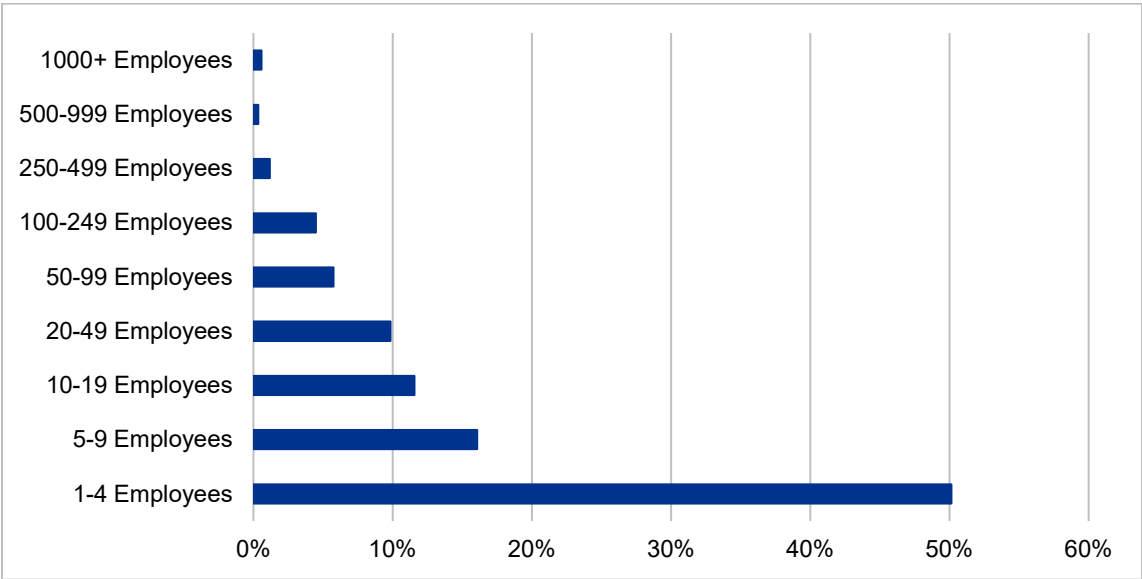
Figure 2: Establishment count and percent change in the US and peer states – 2021 vs. 2024



Sources: QCEW, BLS, 2021 and 2024

As seen in Figure 3, the life sciences industry in Pennsylvania largely comprises smaller establishments with fewer than 100 employees. In 2023 alone, more than 65 percent of life sciences establishments had fewer than 10 employees. At the other end of the scale, establishments with 500 and more employees only accounted for approximately 1 percent of life sciences establishments.

Figure 3: Life Sciences establishments in Pennsylvania by number of employees in 2023



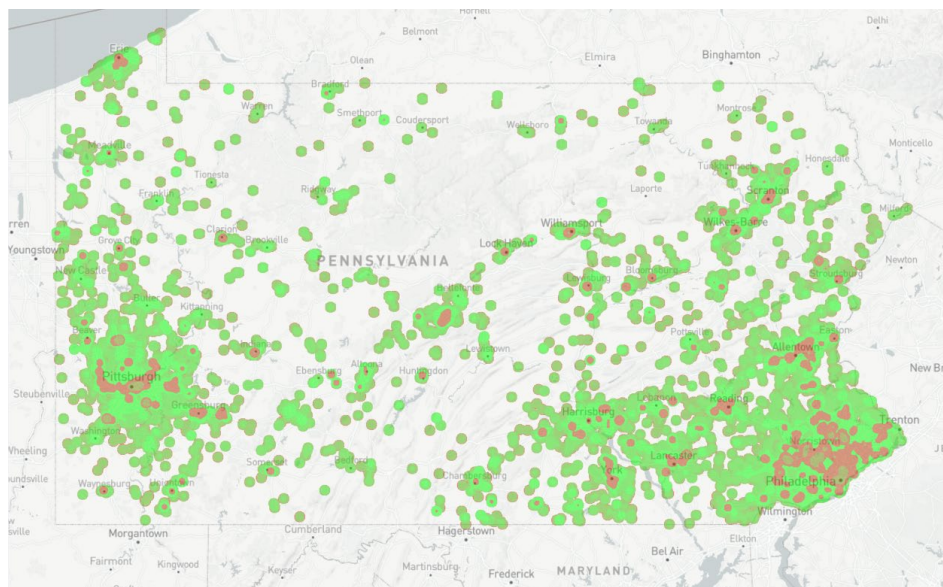
Source: KPMG analysis of US Census Bureau data, 2023

Geographic distribution of establishments

Figure 4 illustrates the geographic distribution of Pennsylvania's life sciences establishments in 2024, highlighting the industry's extensive presence throughout the state. Within Figure 4, darker shading highlights denser concentrations of life sciences establishments within the state's primary life sciences hubs. Some of the largest concentrations appear in Pittsburgh and Philadelphia, where academic and medical research ecosystems attract investment and contribute to workforce needs.

- Pittsburgh, which features a cluster anchored by higher-education institutions and local firms with leading life sciences research programs, fosters a relatively high concentration of activity.
- Philadelphia is where globally recognized leaders in life sciences academic and industry research and manufacturing drive activity. Philadelphia is also home to a cluster of companies, research institutions, and facilities focused on CGT research and treatment development.
- Smaller but important concentrations of life sciences activity also appear in the Lehigh Valley (Allentown-Bethlehem-Easton MSA), Central PA (State College and Harrisburg-Lebanon-Carlisle MSA), and Scranton/Wilkes-Barre-Hazleton MSA. Please refer to the Regional Life Sciences snapshots section for more details.
- Meanwhile, the North Central region shows a much more limited presence, reflecting the industry's tendency to concentrate in urban research corridors.

Figure 4: Heatmap of Life Sciences establishments in Pennsylvania

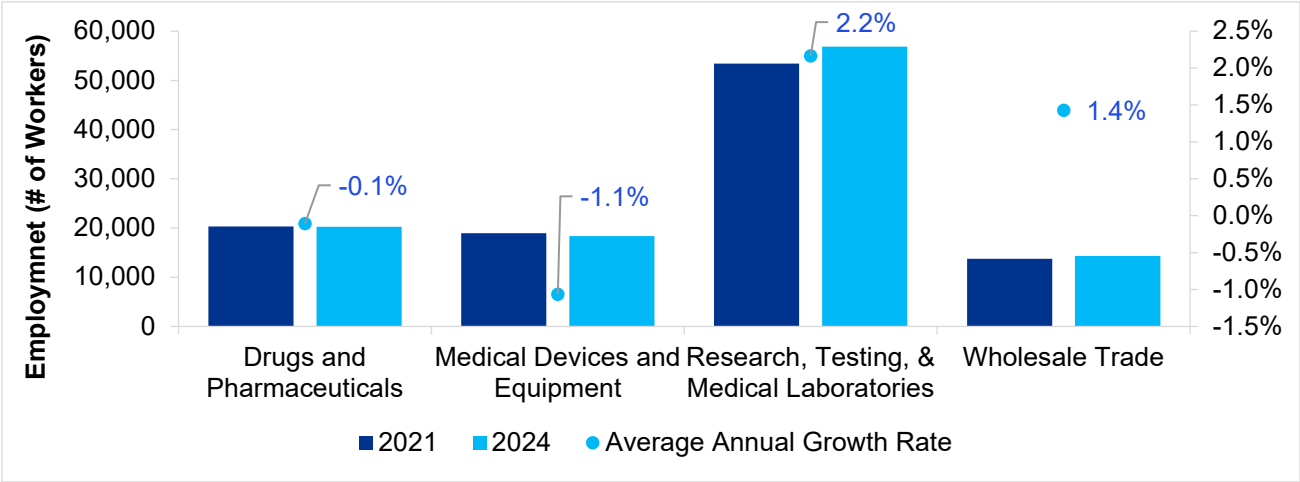


Source: KPMG analysis of Dun & Bradstreet data, 2024

Pennsylvania's life sciences industry recorded overall modest gains in employment and wages from 2021 to 2024, although growth varied by subsector (Figure 5). Tracking the changes in the number of establishments by subsector, the research, testing & medical laboratories subsector recorded the largest growth in both employment and wages from 2021 to 2024 across all subsectors. Employment in this subsector increased by 2.2 percent to 56,900 workers. The wholesale trade subsector also experienced employment growth by 1.4 percent. In contrast, the medical devices and equipment subsector and drugs

and pharmaceuticals subsector registered a slight employment decline of 1.1 percent and 0.1 percent, respectively.

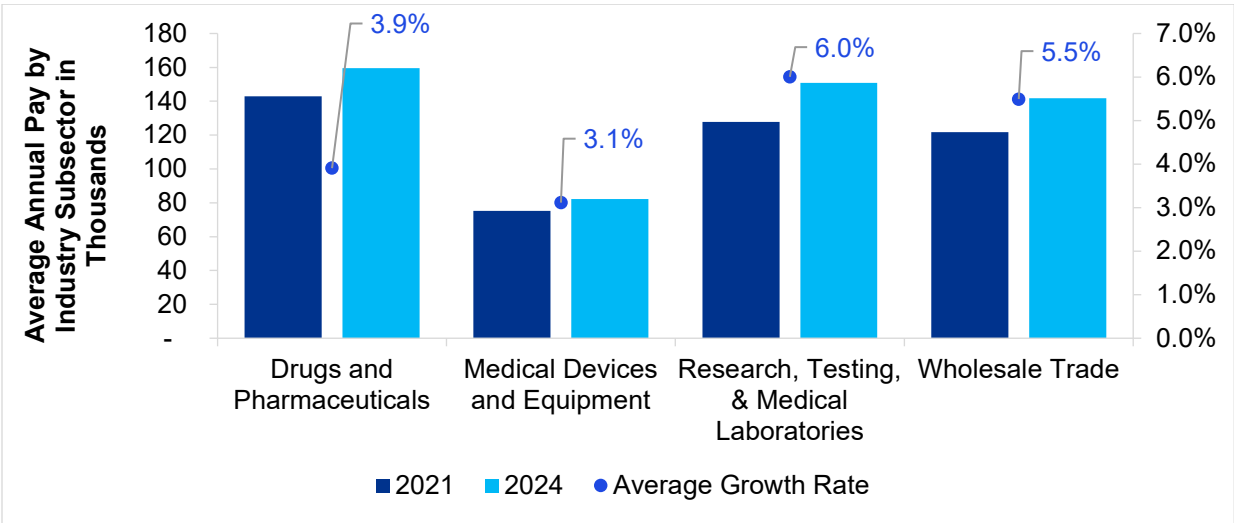
Figure 5: Average employment level and average annualized employment growth across Pennsylvania’s Life Sciences from 2021 to 2024



Sources: QCEW, BLS, 2021 and 2024

As shown in Figure 6, all subsectors experienced increase in average annual pay between 2021 and 2024. The research, testing & medical laboratories subsector recorded the largest growth, rising by 6 percent to \$150,825 in 2024, followed by wholesale trade at 5.5 percent, drugs and pharmaceuticals at 3.9 percent, and medical devices and equipment at 3.1 percent. Among all subsectors, drugs and pharmaceuticals offered the highest average annual pay over this period, reaching \$159,539 in 2024.

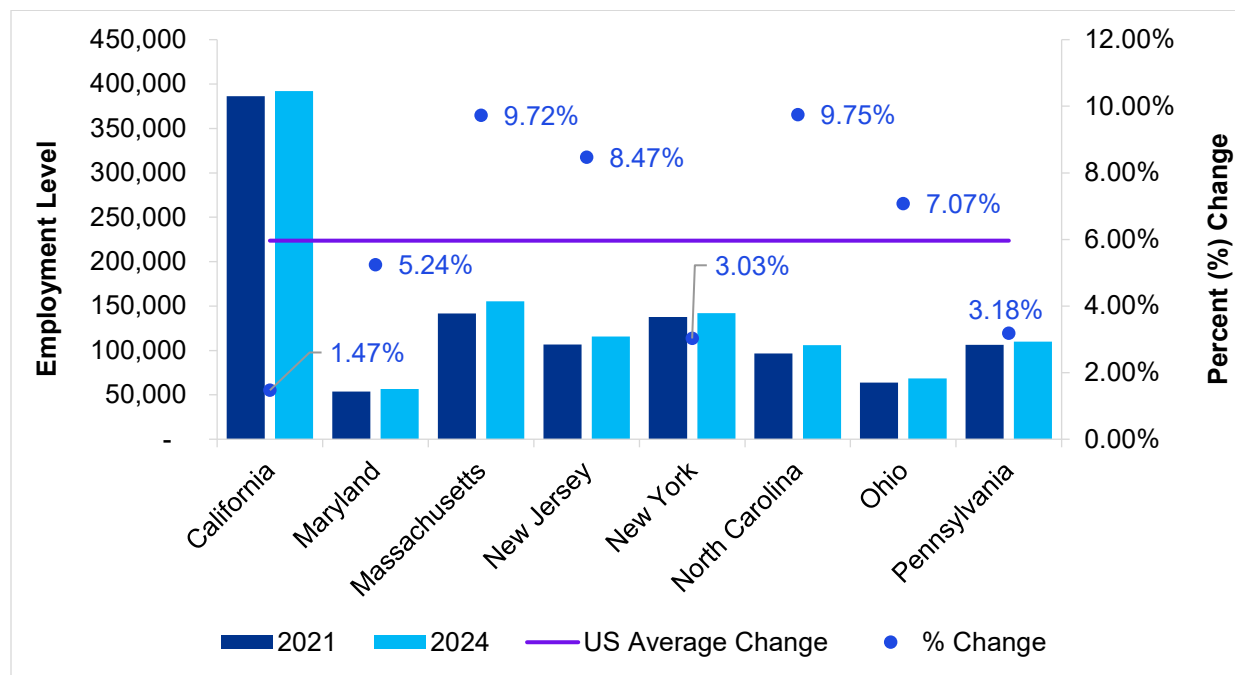
Figure 6: Average annual pay and average annualized annual pay growth across Pennsylvania’s Life Sciences from 2021 to 2024



Sources: QCEW, BLS, 2021 and 2024

Compared to the peer states, Pennsylvania experienced more modest growth in life sciences employment between 2021 and 2024, lagging slightly behind the national average of 5.9 percent (Figure 7).

Figure 7: Direct employment growth and percent change in the US and peer states – Comparing 2021 to 2024



Sources: QCEW, BLS, 2021 and 2024

Pennsylvania seeks to encourage the growth and retention of its life sciences industry through targeted incentive programs. Data from Wavteq,⁵ a foreign direct investment consulting firm that records deals that use incentives, provides a snapshot of how incentives⁶ are utilized by Pennsylvania companies to grow their businesses. The goal of these incentives is to support expansion, retention,⁷ or new projects.

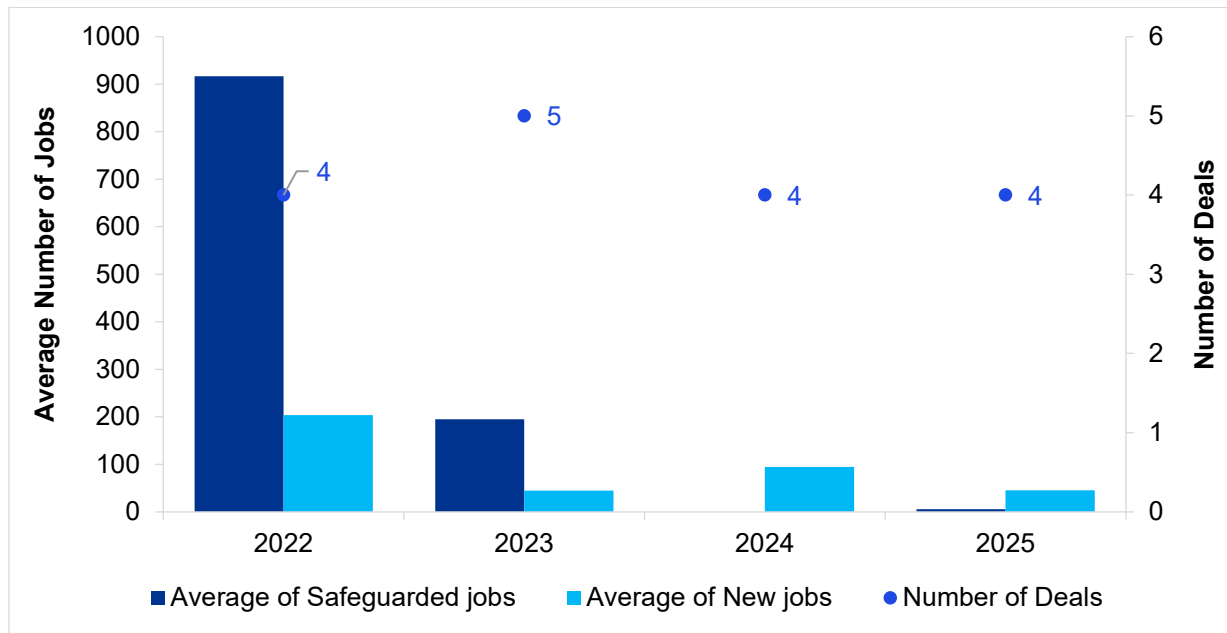
As shown in Figure 8, the number of incentives-related deals made by life sciences companies has been stable from 2022 to 2025; the average deal size has been significantly smaller than in earlier years, with the exception of recent investments in pharmaceutical manufacturing of approximately \$800 million. Overall, expansion projects accounted for the majority of activity over this period, while new projects and retention projects were less common (Figure 9).

⁵ Economic Development Incentive Platform | Incentive. Wavteq.com

⁶ Different incentives include tax rebates, a grant of subsidy, a loan or credit, and other nonfinancial incentives such as infrastructure development.

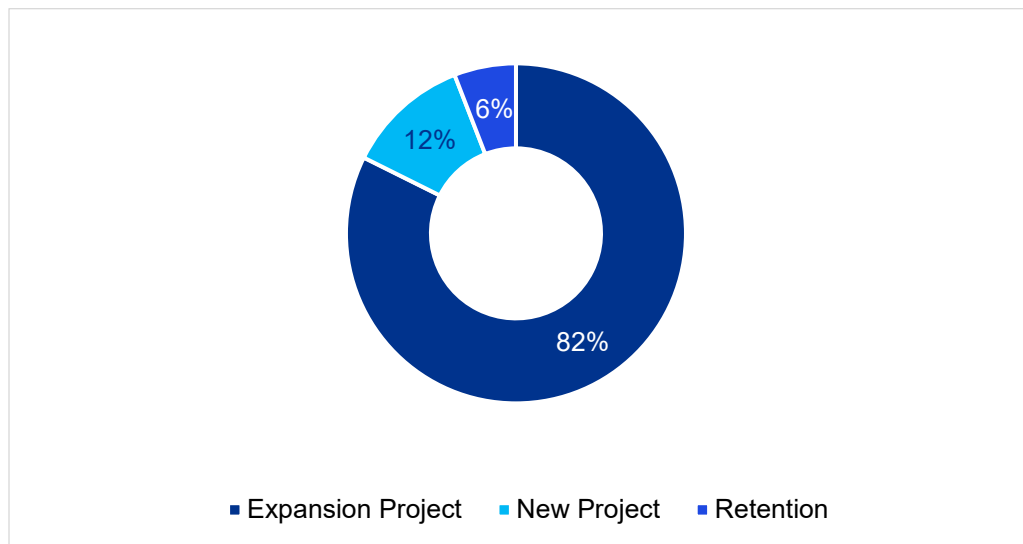
⁷ Expansion is a project that works to expand the reach of the company. Retention is a project seeking to retain employment at the company.

Figure 8: Average number of jobs – new and safeguarded – and deals in Pennsylvania – Comparing 2021 to 2025⁸



Source: Wavteq, 2022–25

Figure 9: Types of incentive-based deals and related projects



Source: Wavteq, 2022–25

⁸ Duplicate deal removed from data set.

Commonwealth support

The Commonwealth has implemented a number of programs supporting the growth of the life sciences industry through financial support, tax benefits, and investment initiatives. Table 2 summarizes certain Commonwealth programs available to the industry, including the R&D Tax Credit Program, the Life Sciences Greenhouse Initiative, the Redevelopment Assistance Capital Program (RACP), the Keystone Innovation Zone (KIZ) Tax Credit Program, and the Ben Franklin Technology Partners Initiative.

Table 2: Commonwealth incentive programs

Program name	Program description	Beneficiaries	Proposed budget or total funding
R&D Tax Credit Program ⁹	A statutory credit in the amount of 10.0 percent of the increase in qualified research expenditures	637 companies annually	\$60M proposed budget
Life Sciences Greenhouse Initiative ¹⁰	A special appropriation fund to promote early-stage risk capital and catalyst development and creation of new life sciences related products and companies	224 new life sciences enterprises formed since 2002	Approximately \$128M since 2002
Ben Franklin Technology Development Authority Fund	A special appropriation fund to promote entrepreneurial business environment, advance technology innovation, and create technology ready workforce	45 life sciences companies in 2025	\$17 million proposed budget
KIZ ¹¹	A statutory tax credit offered to targeted industries (including life sciences) in an amount derived in the zone over the previous two years, subject to limitations	78 life sciences companies from 2017 to 2024	\$11M in total tax credits to life sciences companies¹²
RACP	A special appropriation fund to support major regional economic development projects, including those in the life sciences industry	121 life sciences projects from 2015 to 2025	\$215M in total funding from 2015 to 2025¹³

⁹ Pennsylvania Department of Revenue. Research & Development Tax Credit Program. Available at [2025 Research & Development Tax Credit Report to the Pennsylvania General Assembly \(DOP-26\)](#)

¹⁰ PA Life Sciences Greenhouses. Available at [PA Life Sciences Greenhouses](#)

¹¹ Pennsylvania Department of Community and Economic Development. Keystone Innovation Zone (KIZ) Tax Credit Program. Available at [Keystone Innovation Zone \(KIZ\) Tax Credit Program - PA Department of Community & Economic Development](#)

¹² Based on KPMG's analysis of 2017-24 KIZ award recipient data and 2025 Dun & Bradstreet data.

¹³ RACP investment data is unavailable for 2016 and 2024, as distinct funding rounds do not exist for those years. Funding awarded during those years may be recorded under adjacent funding rounds.

Program name	Program description	Beneficiaries	Proposed budget or total funding
PA First	A discretionary cash grant awarded to promote job creation and capital investment in the Commonwealth	Not available	\$38M proposed budget for FY2026 – 27¹⁴

¹⁴ Governor Josh Shapiro Executive Budget 2026-2027. Commonwealth of Pennsylvania. Available at [2026-27 Budget Document](#)

Research excellence

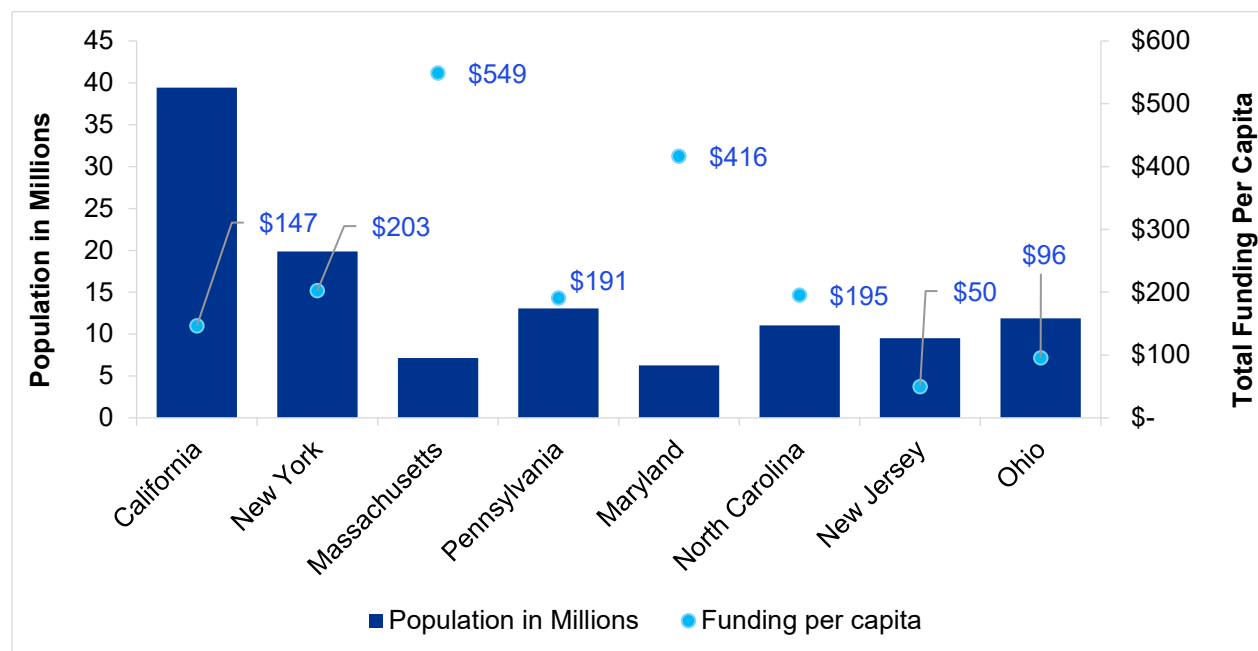
Research and development

Federal funding such as NIH and NSF also form a significant component in providing sustained support for life sciences research and development. These investments underpin the innovation pipeline that ultimately supports commercialization and company formation.

Figure 10 presents a comparison of combined NSF and NIH funding per capita (a standardizing adjustment for state size) in Pennsylvania with that of peer states. In 2024, Pennsylvania received \$2.5 billion in combined NIH and NSF funding, placing it in the middle of the pack among its peer group in terms of total dollars. California led with roughly \$5.8 billion, followed by New York (\$4.0 billion) and Massachusetts (\$3.9 billion). Maryland and North Carolina also attracted substantial federal support at \$2.6 billion and \$2.2 billion, respectively, while New Jersey and Ohio received comparatively lower combined funding.

On a per capita basis, Pennsylvania's standing among peer states remained largely unchanged over time, with the Commonwealth consistently positioning in the middle of the group. The Commonwealth received \$191 per capita in combined NIH and NSF funding, ranking fifth among its peers. While Pennsylvania is a significant recipient of federal life sciences research and development funding with a scale of activity comparable to peer states, there remains opportunity to further increase its share of total federal funding per capita.

Figure 10: Total NSF and NIH funding (FY 2024) per capita based on 2024 population

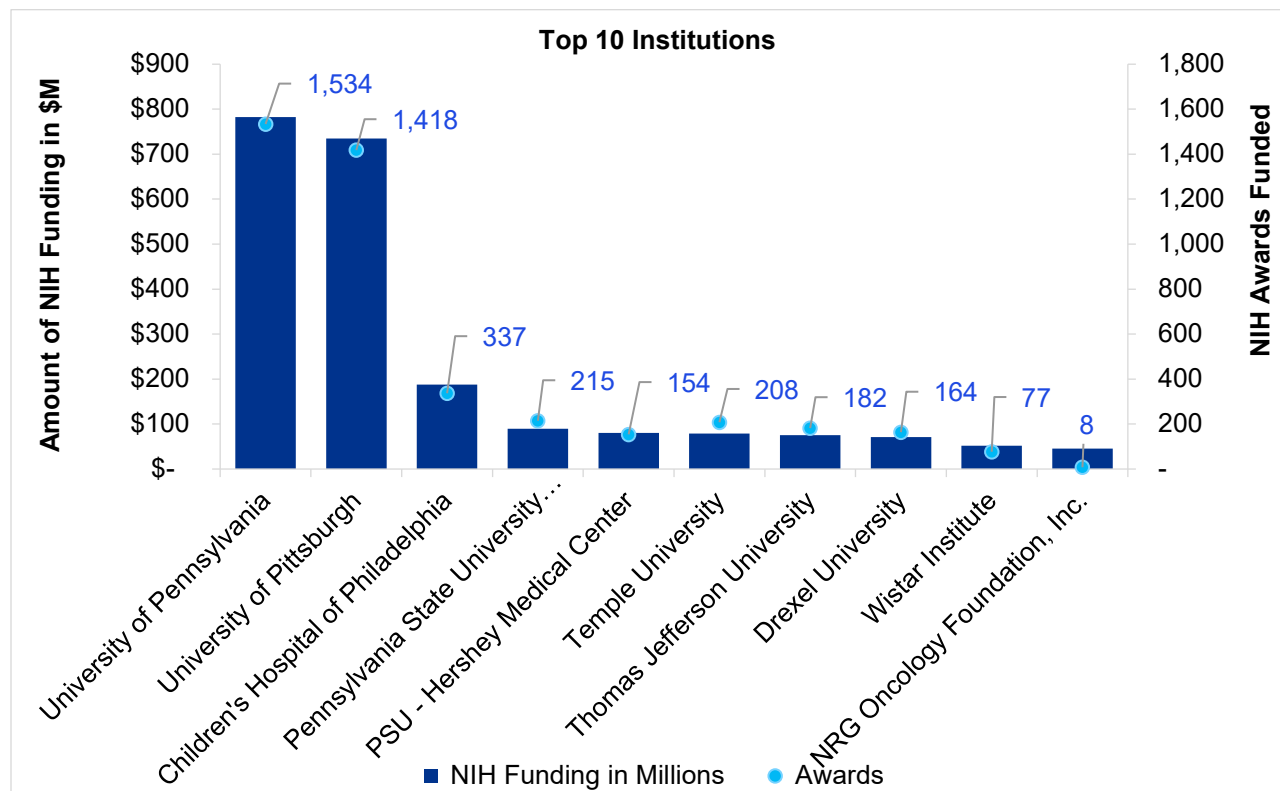


Sources: NIH, NSF, FY 2024, US Census Bureau, 2024

NIH funding to recipients in Pennsylvania is concentrated among a small number of universities. The University of Pennsylvania and the University of Pittsburgh are the two largest recipients, receiving approximately \$782 million (1,534 awards) and \$735 million (1,418 awards), respectively. Collectively, they account for more than 60 percent of all NIH funding awarded to Pennsylvania in 2024.

In addition to these two research universities, several other universities and affiliated healthcare and research institutions also attracted substantial NIH support. The Children's Hospital of Philadelphia and Penn State Hershey Medical Center stand out, receiving \$188 million across 337 awards and \$80 million in 2024, respectively. The Pennsylvania State University (\$89 million), Temple University (\$79 million), Thomas Jefferson University (\$76 million), Drexel University (\$71 million), the Wistar Institute (\$52 million), and NRG Oncology Foundation (\$45 million) also represent significant recipients (see Figure 11). Collectively, the top 10 institutions account for nearly 90 percent of NIH funding awarded to Pennsylvania in 2024. This pattern suggests that Pennsylvania's life sciences R&D ecosystem is led by activity concentrated among a relatively small group of research-oriented universities, academic medical centers, and research institutes.

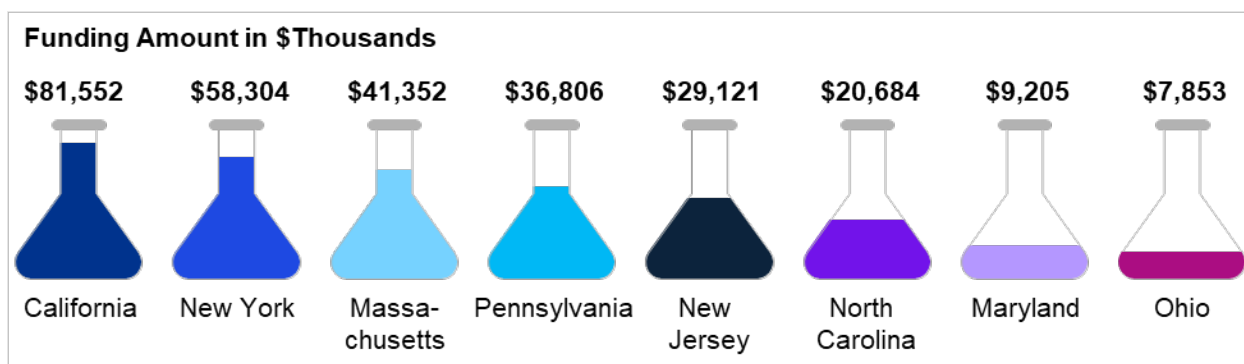
Figure 11: Top 10 Pennsylvania institutions that received NIH funding by amount and number of awards in FY 2024



Source: NIH, FY 2024

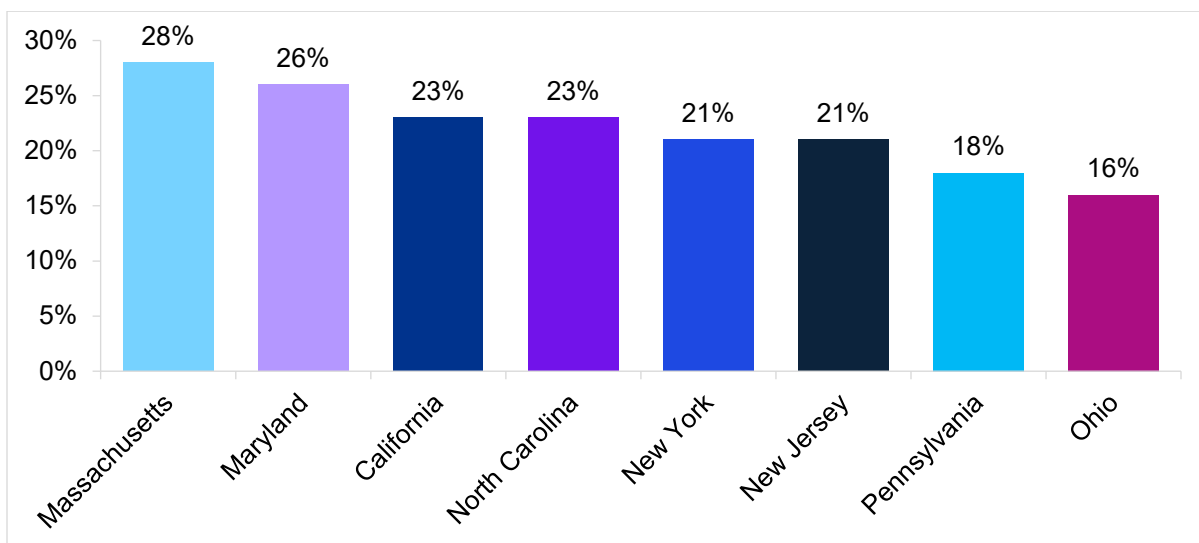
Pennsylvania also ranks within the middle of the peer states for NSF life sciences funding, and this relative ranking has remained largely unchanged between fiscal years 2021 and 2024. In fiscal year 2024, it received over \$36 million in NSF funding (Figure 12), less than major coastal hubs such as California, New York, and Massachusetts but more than New Jersey, North Carolina, Maryland, and Ohio. At the same time, as shown in Figure 13, Pennsylvania's funding rate (18 percent) lags somewhat behind most of its peer states, while remaining ahead of Ohio.¹⁵ Together, these indicators suggest that Pennsylvania has a strong research base and competitive performance, but there is room to improve its success rate and further narrow the gap with life sciences research hubs in peer states. It should also be noted that NSF funding rates decreased nationwide in 2025, with a 26.9 percent decline from last year, adding further competitive pressure across all states.¹⁶

Figure 12: NSF research grants by state in FY 2024



Source: NSF awards funded by the Directorate for Biological Sciences (BIO), FY 2024

Figure 13: NSF research grants funding rates by state in FY 2024



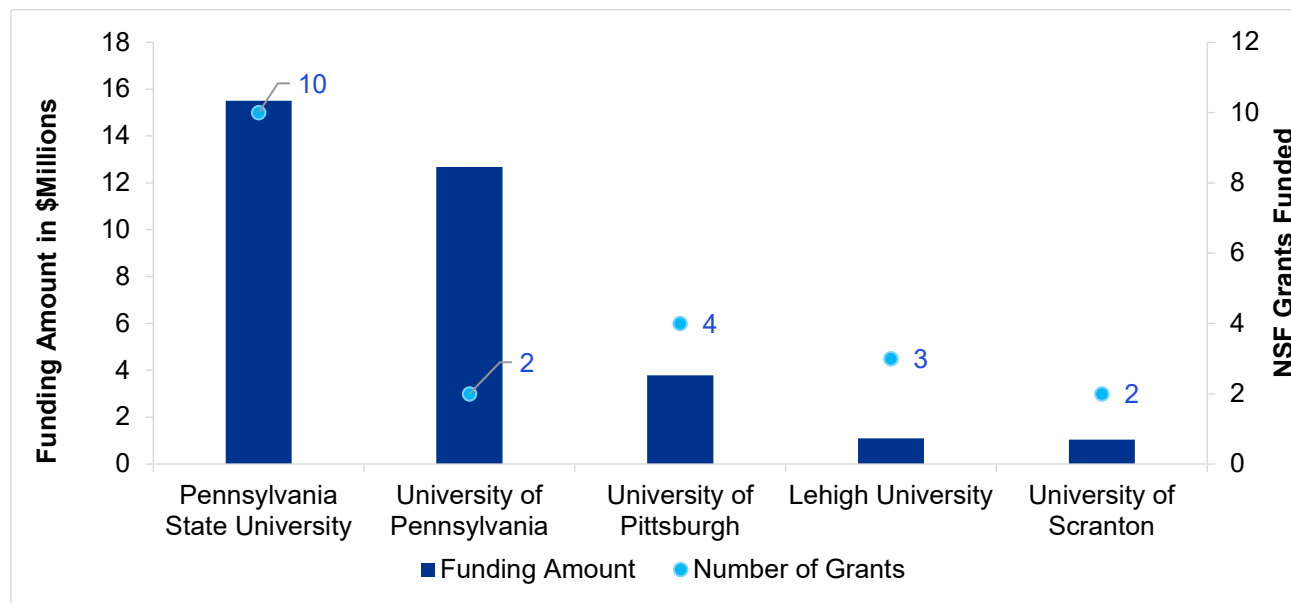
Source: NSF, Directorate for Biological Sciences (BIO), FY 2024

¹⁵ The funding rate is the number of new (competitive) awards divided by the number of awards plus declines acted upon in the given fiscal year.

¹⁶ National Institutes of Health. NSF by the numbers. Available at [Workbook: NSF by Numbers](#).

Pennsylvania universities accounted for 98 percent of total life sciences NSF funding received by the Commonwealth in fiscal year 2024. Figure 14 shows the top five universities that received NSF funding.

Figure 14: Top five Pennsylvania universities that received NSF funding by amount and number of grants in FY 2024



Source: NSF, Directorate for Biological Sciences (BIO), FY 2024

Infrastructure and facilities

Beyond financial support, the availability and utilization of physical infrastructure are critical determinants of competitiveness in the life sciences sector.

Pennsylvania has been actively expanding its life sciences research infrastructure, though its investment profile differs from several peer states.¹⁷ Between 2021 and 2023, Pennsylvania substantially increased its new construction of life sciences research space from roughly 24,000 square feet in 2021 to about 227,000 square feet in 2023 – one of the larger jumps among peer states.¹⁸ Over the same period, however, planned new construction of life sciences research space declined from approximately 452,000 square feet to about 84,000 square feet in 2023. This shift suggests that projects that were previously in the planning pipeline have moved into active construction, and the recent activity has been more focused on executing committed projects, with a moderation of new large-scale builds over the near-term horizon.

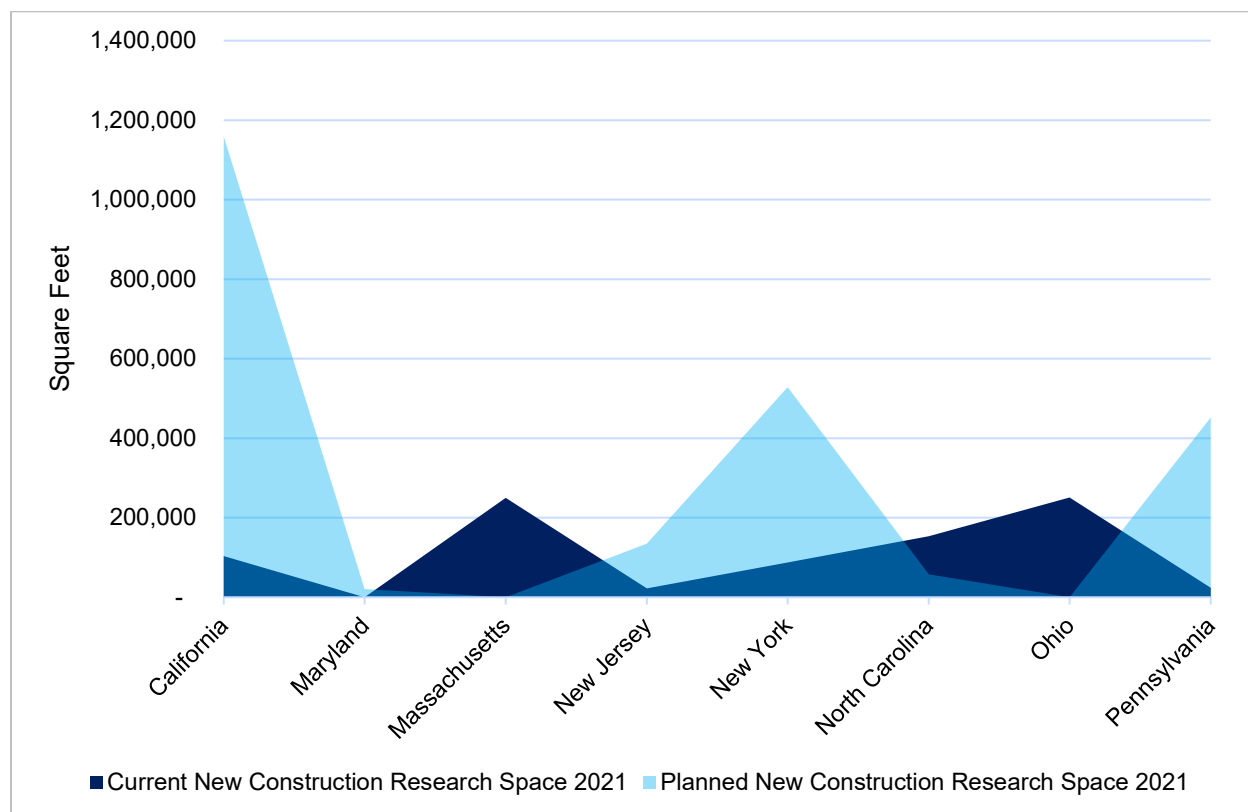
Figure 15 and Figure 16 below further illustrate these dynamics: In most states, planned construction peaks higher than current construction in 2023, suggesting a deceleration in construction activities. In California and Pennsylvania, current construction peaks higher than planned construction, indicating accelerating construction activity.

¹⁷ In this case, “life sciences research infrastructure” refers to space used for research in agricultural sciences, biological sciences, biomedical sciences, health sciences, natural sciences, and conservation.

¹⁸ “Current new construction” refers to current new construction of science and engineering research facilities that started during the previous or current fiscal year (e.g., 2022 or FY 2023 for 2023 data).

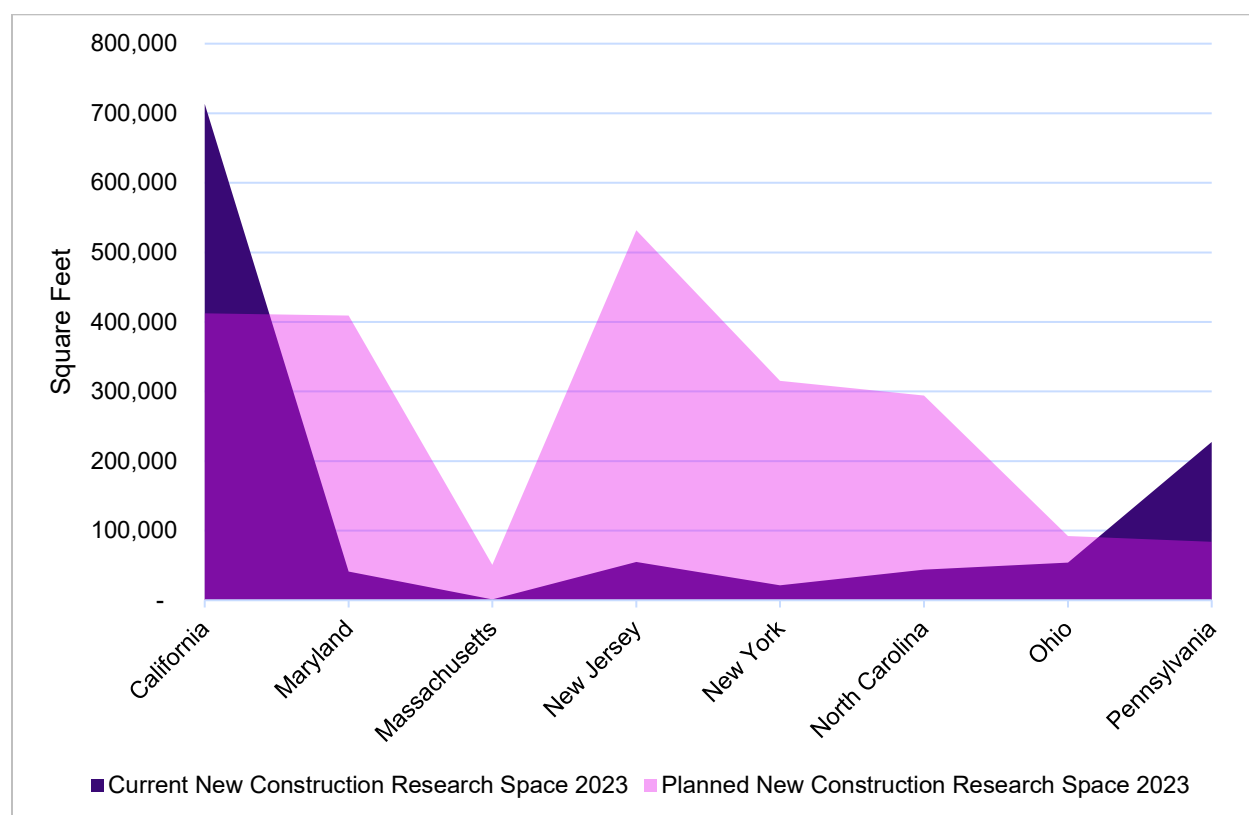
In dollar terms, Pennsylvania's current new construction costs for life sciences research space rose from about \$46 million in 2021 to \$255 million in 2023, reflecting a strong near-term build-out of research capacity. At the same time, planned construction costs for life sciences research space fell from roughly \$447 million to \$76 million, in contrast to states such as California, Maryland, New Jersey, and North Carolina, which report both large current projects and sizable pipelines of planned space and associated costs.

Figure 15: Amount of pending research space (planned or currently under construction) in the Life Sciences industry by state, in square feet, 2021



Source: NSF – National Center for Science and Engineering Statistics (NCSES), FY 2021.

Figure 16: Amount of pending research space (planned or currently under construction) in the Life Sciences industry by state, in square feet, 2023

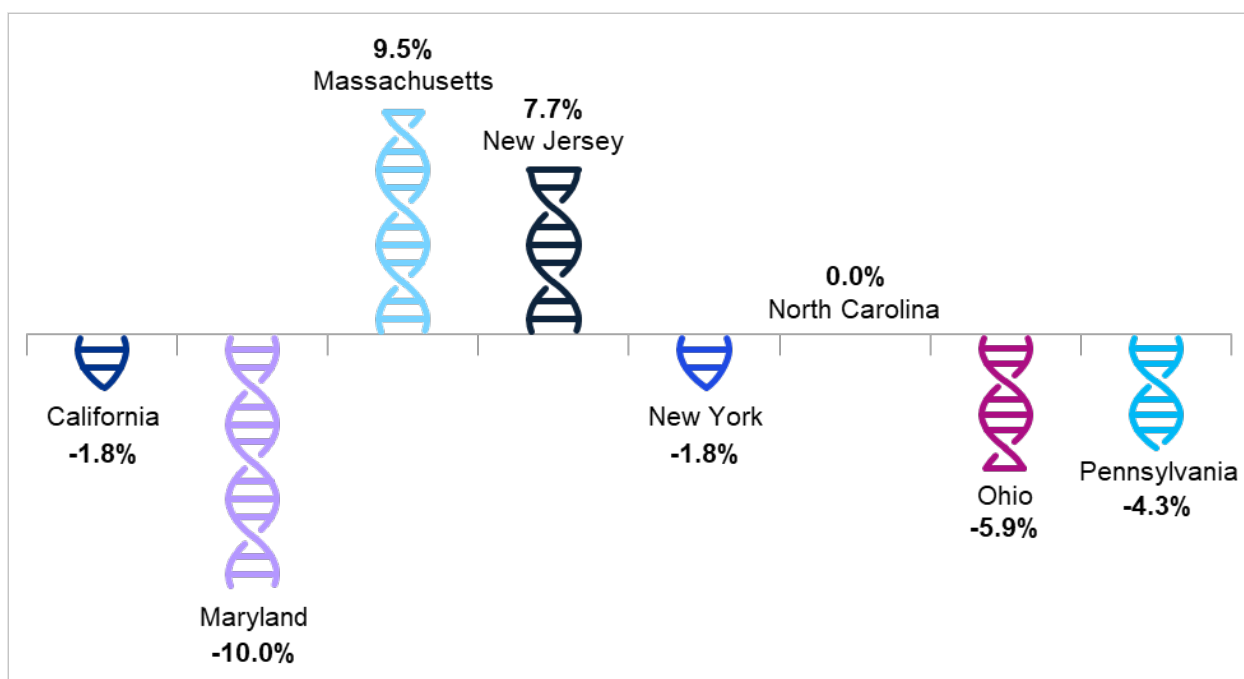


Source: NSF – NCSES, FY 2023.

Relative to these peers, Pennsylvania is emerging from a phase of intensive delivery of previously planned facilities and is actively bringing significant research space online, while its peers are in an early-stage expansion of a new wave of projects.

Between 2021 and 2023, Pennsylvania saw a 4.3 percent decline in the number of institutions with life sciences research space. This was the third-largest decrease among peer states, behind Ohio at 5.9 percent and Maryland at 10.0 percent (Figure 17).

Figure 17: Percent change in number of institutions with research space by state, 2021 – 2023



Source: NSF –NCSES, FY 2021–23

Patents

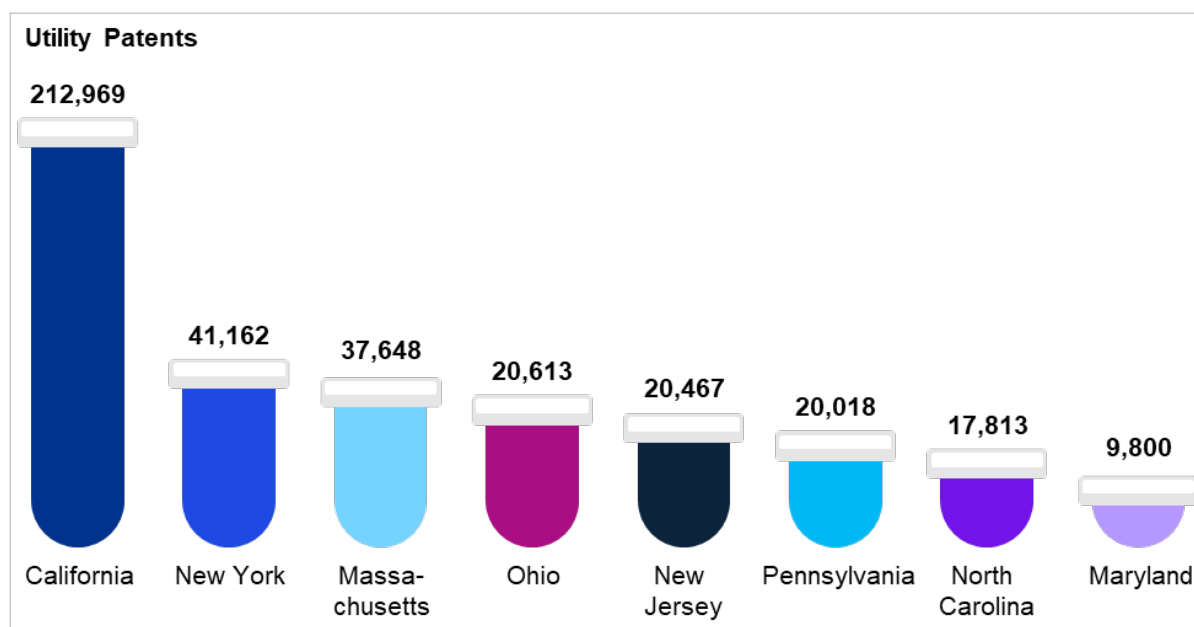
Patents are a key indicator of innovation in the life sciences sector. Because life sciences patents are often correlated with emerging technologies and commercialization of clinical products, the trajectory of life sciences patents provides insight into future commercial outcomes for patented products. Since there is no specific designation to identify a life sciences patent, utility patents are used as a proxy to measure Pennsylvania's life sciences patent activity relative to its peers.

As shown in Figure 18, from 2018 to 2022, Pennsylvania issued 20,018 patents in total, placing it behind national leaders such as California, New York, and Massachusetts, slightly behind Ohio and New Jersey, and ahead of North Carolina and Maryland. When looking at growth in patents over time, Pennsylvania's performance appears stable to slightly increasing, with patents per 1,000 residents (a standardizing measure of activity) increasing by 0.9 percent over the same period.¹⁹ This growth ranks slightly below that of California (up 3.6 percent) and Massachusetts (up 1.0 percent), but it compares favorably to several peer states, including New York, North Carolina, Ohio, and New Jersey (Figure 19).

¹⁹ "Patents per 1,000 residents" represents a standardized measure of utility patent issuance that attempts to control for the size of a state.

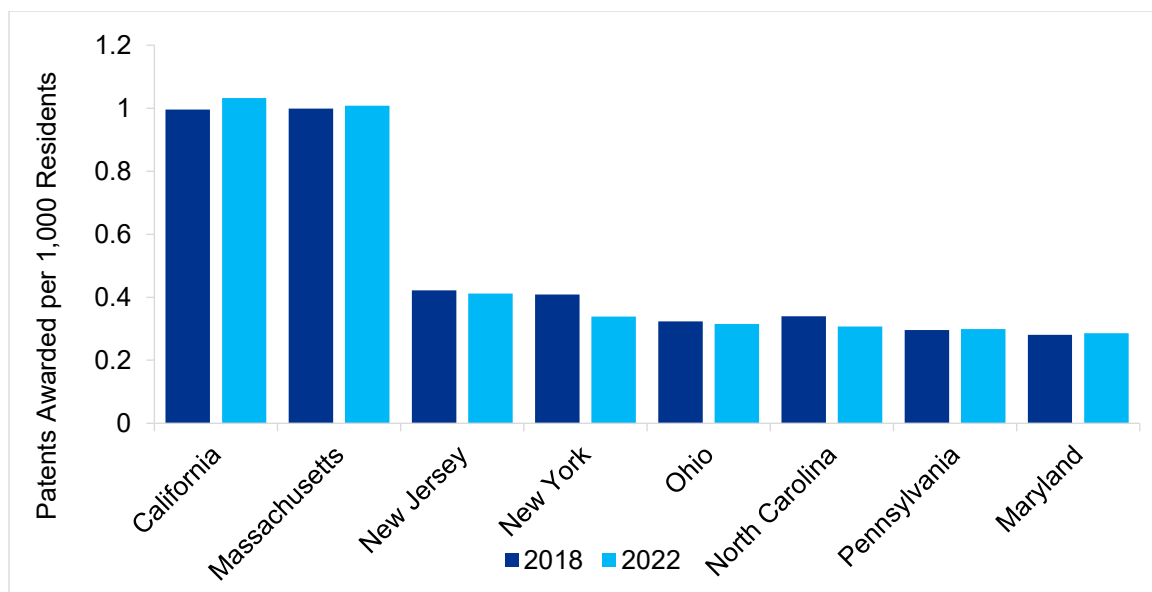
Although Pennsylvania's utility patent issuance remains below leading peers such as California, New York and Massachusetts, the increase in patent issuance in recent years suggests that innovation and commercialization of life sciences products may accelerate in the near term. While it has not yet broken into the top tier of life sciences patent leaders, Pennsylvania has maintained a solid level of patenting activity and a slightly improving per-capita basis at a time when several of its peers have seen their relative patent intensity decline.

Figure 18: Total number of utility patents issued by state from 2018 to 2022



Source: NSF analysis of US Patent and Trademark Office (USPTO) data, 2018–22

Figure 19: Patents awarded per 1,000 residents from 2018 and 2022

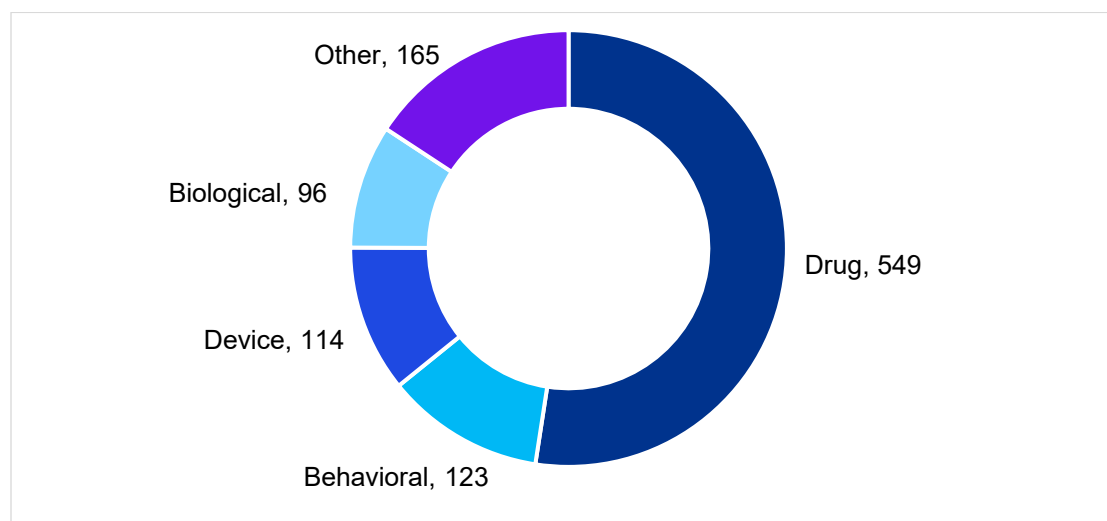


Source: USPTO, 2018–22

Clinical trials

Clinical trials are the primary mechanism for scientific discoveries to be translated into practical, usable therapies. There is a variety of research efforts taking place in Pennsylvania's clinical trial landscape (see Figure 20). The Commonwealth's clinical trials predominantly focus on the development and testing of new drugs, with 549 drug-related trials reported accounting for 52 percent of all clinical trials in 2024. Other major intervention types include behavioral studies (12 percent), device trials (11 percent), and biological intervention (9 percent). The remaining 165 trials span a range of other categories such as procedures, dietary supplements, combination products, and diagnostic tests.

Figure 20: Clinical trials conducted in Pennsylvania by type in 2024



Source: National Library of Medicine, ClinicalTrials.gov, 2024

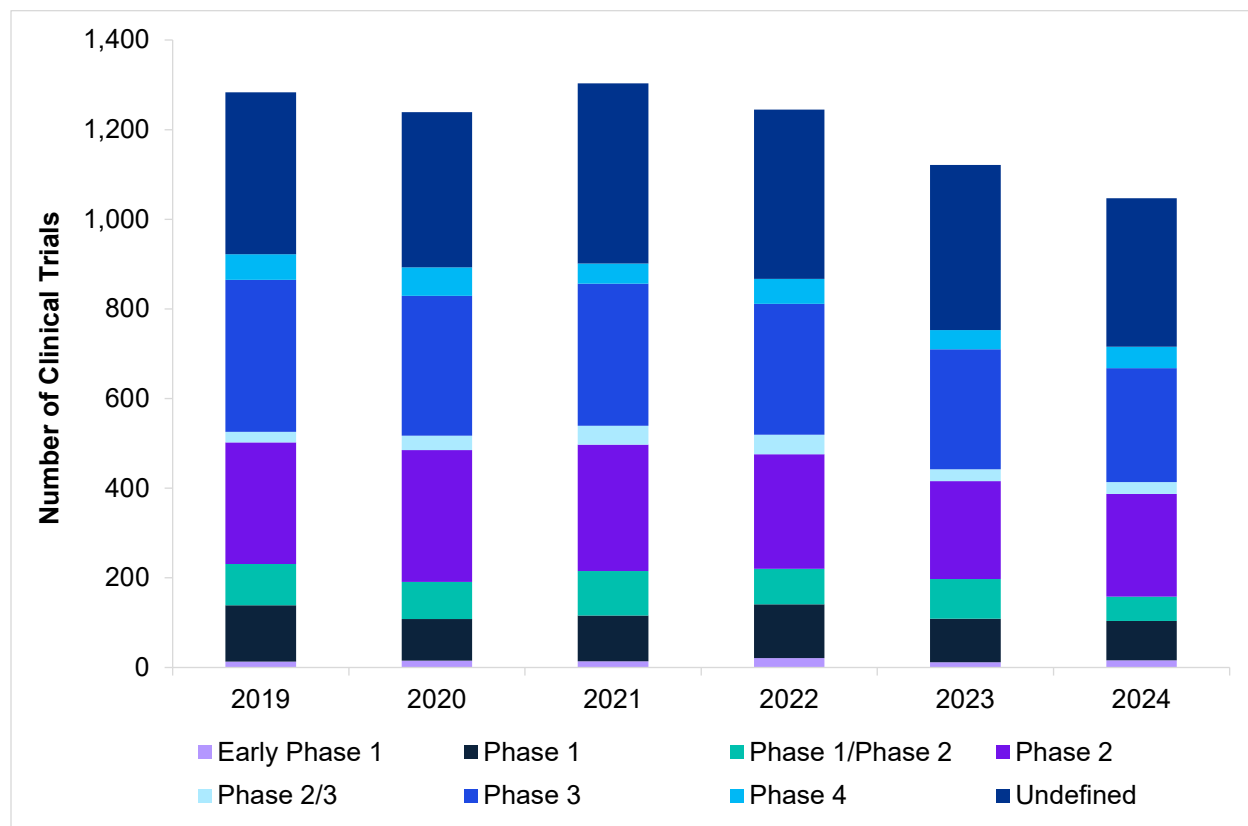
Figure 21 shows data for Pennsylvania's drug and biological clinical trials broken down by phases.

- Between 2019 and 2024, the Commonwealth consistently supported hundreds of active trials annually, with most activity concentrated in mid- to late-stage development.
- Phase 2 and Phase 3 trials together account for the largest share of trials. The number of Phase 2 trials remained relatively stable over the period, ranging from 219 to 249 studies per year. While the number of Phase 3 trials declined from 339 in 2019 to 254 in 2024, this level of activity still represents a strong late-stage pipeline.
- The continued activity in Phase 4 studies each year suggests that a number of products tested have advanced to market and are being monitored in real-world settings.
- Early-stage activity also appears stable over time. Phase 1 and Phase 1/Phase 2 trials²⁰ show some year-to-year fluctuation but remain a consistent component of the portfolio, indicating a steady flow of new candidates entering first-in-human and dose-finding studies.

²⁰ Phase 1 trials primarily evaluate safety, side effects, and the best dose and schedule of a new treatment. Phase 1/Phase 2 trials combine this initial safety and dose-finding work in Phase 1 with an early assessment of how well the treatment works against a specific disease (Phase 2).

Overall, the data indicates that Pennsylvania supports a full continuum of clinical research from early-stage safety studies through pivotal Phase 3 and post-approval Phase 4 trials, with modest shifts in volume over time. This pattern reflects a mature and diversified clinical trial environment.

Figure 21: Clinical trials conducted in Pennsylvania by phase from 2019 to 2024²¹

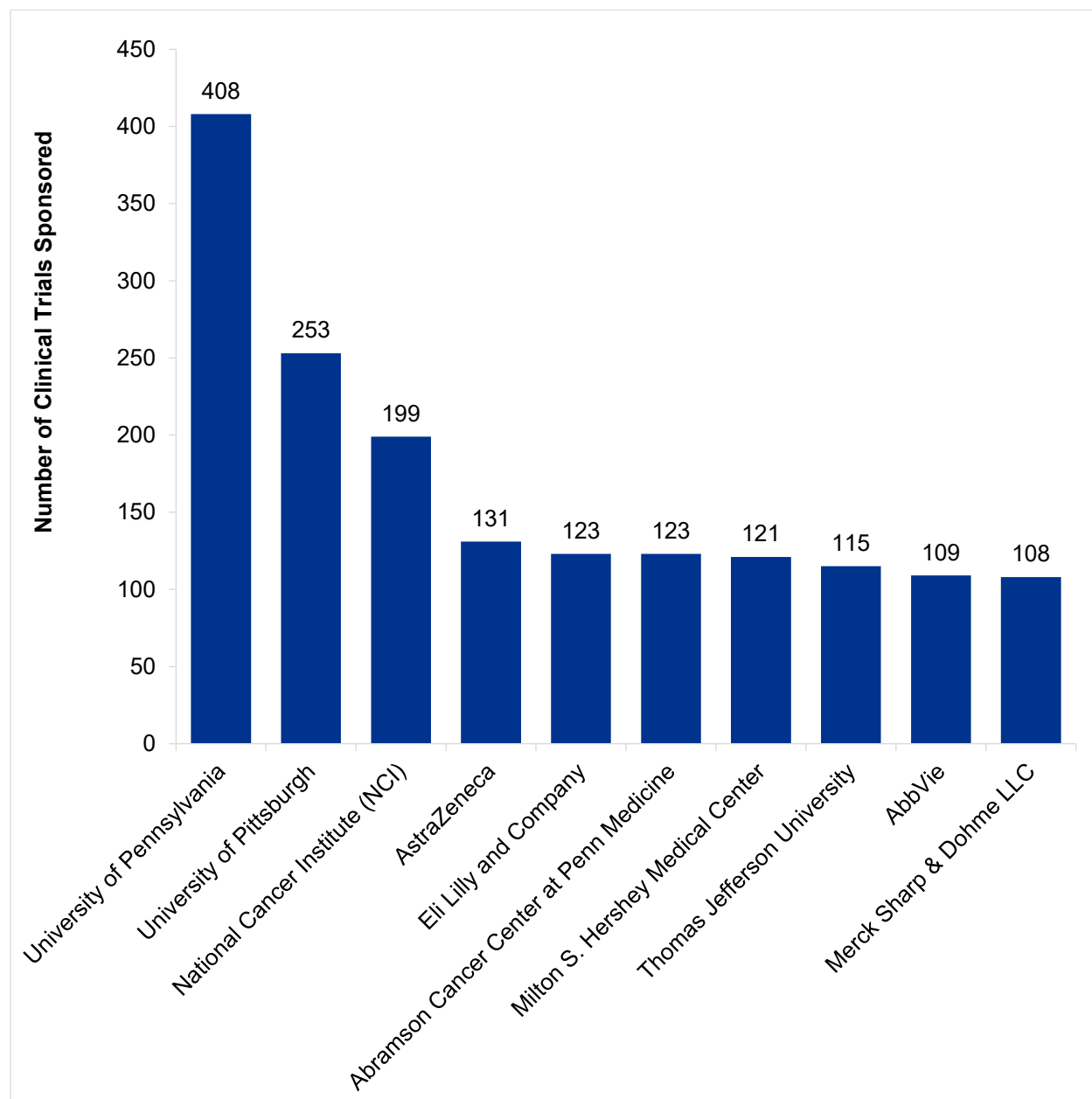


Source: National Library of Medicine, ClinicalTrials.gov, 2019–24

Figure 22 shows the top 10 clinical trial sponsors in Pennsylvania from 2019 to 2024. During the period, the University of Pennsylvania and the University of Pittsburgh were the top two sponsors, accounting for 5.6 percent and 3.5 percent of all trials, respectively. The National Cancer Institute, along with major cancer centers such as the Abramson Cancer Center at Penn Medicine and Milton S. Hershey Medical Center, highlights a strong oncology focus. At the same time, significant contribution from large global pharmaceutical sponsors—including major pharmaceutical manufacturing companies—demonstrates that Pennsylvania is an important hub for industry-sponsored clinical development as well. This data reflects a well-developed ecosystem in which academic, government, and industry sponsors all contribute to a high level of clinical trial activity in the Commonwealth.

²¹ The “Undefined” category, which remains sizable throughout the period, reflects a mix of trials with unclassified phases.

Figure 22: Top 10 clinical trial sponsors for clinical trials conducted in Pennsylvania from 2019 to 2024



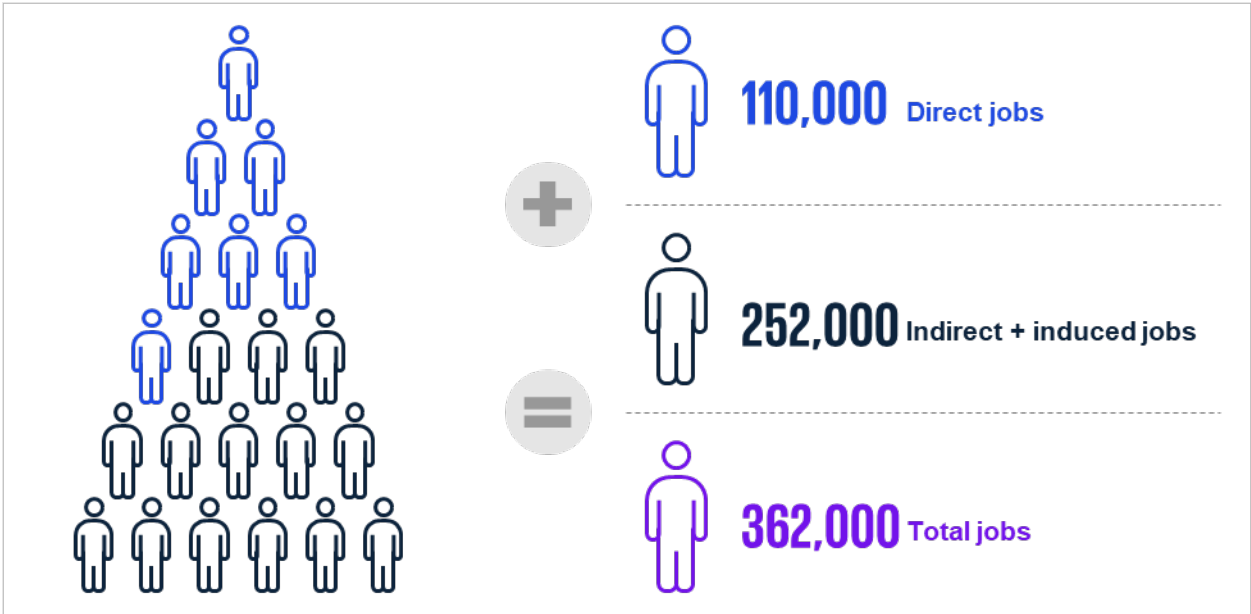
Source: National Library of Medicine, ClinicalTrials.gov, 2019–24

Economic contribution

In addition to its role in driving the research and development of novel medicines and technologies for patients, the life sciences industry contributes meaningfully to the Commonwealth's economy. This section provides estimates of the economic contribution that the life sciences industry brought to the Commonwealth in 2024.²²

In 2024, the Pennsylvania life sciences industry directly contributed over 110,000 jobs and supported 362,000 total jobs (including direct jobs) in the Commonwealth, as shown in Figure 23. The additional indirect and induced jobs are generated as life sciences companies purchase from their supply chain partners, and as life sciences workers spend within the local economy, including spending on local restaurants, retail, and services.

Figure 23: Employment contribution



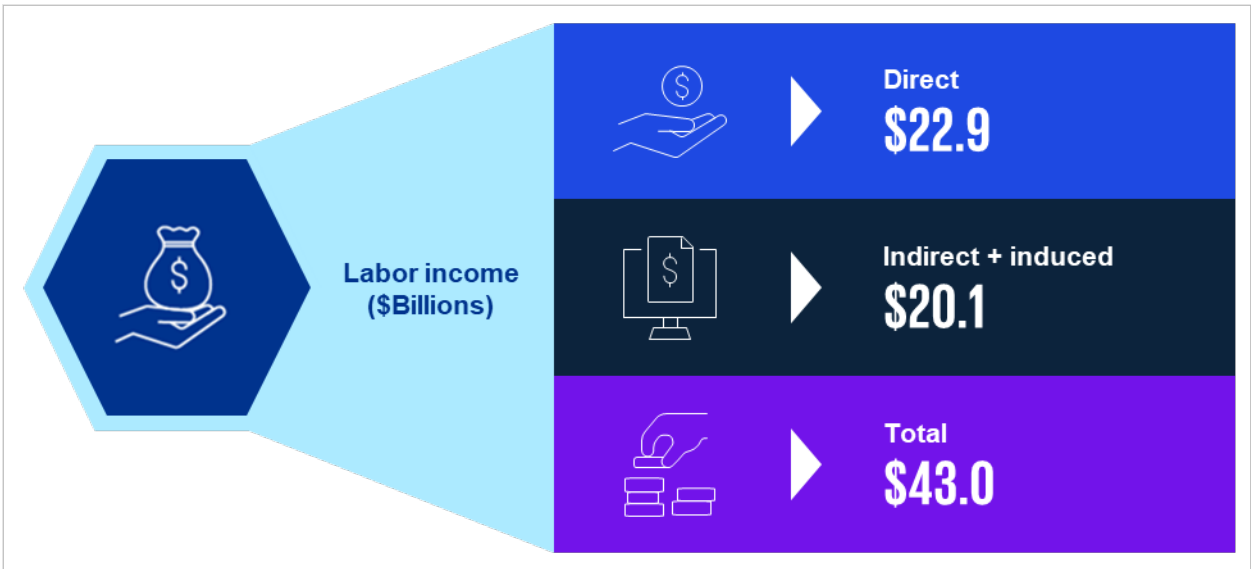
Source: KPMG analysis using IMPLAN,²³ 2024

As shown in Table 3, labor income—including wages, salaries, and benefits earned by workers—directly attributable to the life sciences industry in Pennsylvania totaled \$22.9 billion, with an average labor income of more than \$200,000 per job in the life sciences industry. An additional \$20.1 billion in labor income resulted from indirect and induced contributions of the life sciences industry in the Commonwealth. This results in a total of \$43.0 billion of labor income being directly or indirectly attributed to the life sciences industry in the Commonwealth.

²² The last full year for which data were available at the time of preparation of the Report.

²³ For more information on the IMPLAN modeling process, visit [IMPLAN.com](https://www.implan.com).

Table 3: Labor income contribution



Source: KPMG analysis using IMPLAN, 2024

As seen in Table 4, the life sciences industry directly contributed \$73.4 billion in economic output, with an additional \$56.5 generated by its indirect and induced activities. Together, this amounts to \$129.9 billion in total economic output to Pennsylvania. This implies that for every \$1.0 billion of economic output directly generated by the life sciences industry, an additional \$0.8 billion in economic output is supported elsewhere in the Commonwealth’s economy through the industry’s supply chain and household spending.

Table 4: Economic output contribution



Source: KPMG analysis using IMPLAN, 2024

In addition to economic contribution, the industry also generated up to \$15.1 billion in federal, state and local taxes (Table 5).

Table 5: Generated tax revenue

Impact	Tax revenue (\$Billions)
 Direct	\$7.6
 Indirect + induced	\$7.5
 Total	\$15.1

Source: KPMG analysis using IMPLAN, 2024

Table 6 shows the employment contribution of the life sciences industry broken down by industry subsector. In 2024, the research, testing & medical laboratories subsector had the single largest contribution to employment, coming in at 190,200 total jobs.

Table 6: Employment contribution by Life Sciences subsectors²⁴

Industry subsector	Direct contribution	Indirect + induced contribution	Total contribution
 Research, testing & medical laboratories	56,900	133,400	190,200
 Drugs and pharmaceuticals	20,400	55,900	76,300
 Wholesale trade	14,400	39,000	53,300
 Medical devices and equipment	18,000	24,000	42,200

Source: KPMG analysis using IMPLAN, 2024

Table 7 shows the sectors that benefit the most from the contributions of the life sciences industry in 2024. Many of these sectors, such as scientific R&D services and pharmaceutical preparation manufacturing, are primarily the result of direct employment within the life sciences industry. The same is true for junior colleges, colleges, universities, and professional schools. The impact on other sectors,

²⁴ Direct, indirect, and induced employment may not add to total due to rounding.

such as other real estate, management of companies and enterprises, and employment services, is attributable to businesses supporting the life sciences industry (indirect and induced effects).

Table 7: Employment contribution by individual industries

Sector	Employment
 Scientific research and development services	42,400
 Other real estate	17,500
 Pharmaceutical preparation manufacturing	14,500
 Junior colleges, colleges, universities, and professional schools	13,400
 Medical and diagnostic laboratories	10,800
 Management of companies and enterprises	9,900
 Wholesale – Professional and commercial equipment and supplies	9,500
 Hospitals	9,300
 Wholesale – Drugs and druggists' sundries	8,800
 Employment services	8,600
 Full-service restaurants	7,900
 Couriers and messengers	7,700
 Surgical and medical instrument manufacturing	7,200
 Individual and family services	6,300
 Limited-service restaurants	6,100

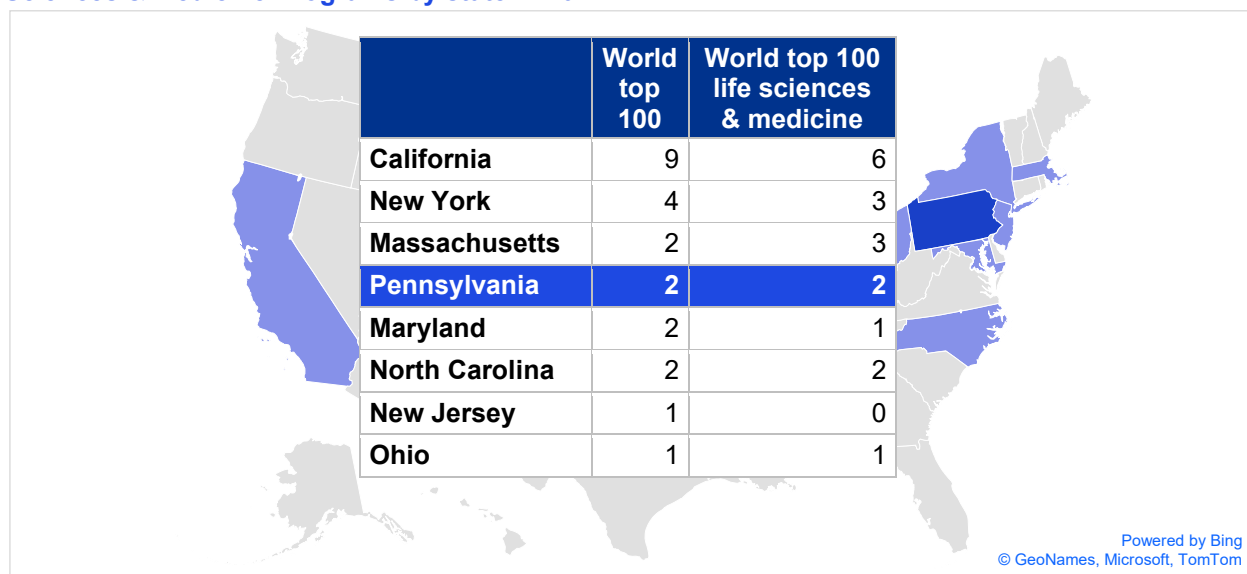
Source: KPMG analysis using IMPLAN, 2024

Academic contribution

The contributions of the life sciences sector are reinforced by the strength of the Commonwealth's academic institutions, which serve as powerful engines for research, talent development, and innovation.

- In 2024, the University of Pennsylvania and University of Pittsburgh were ranked in the Shanghai Index of World Top 100 universities and in Quacquarelli Symonds' World Top 100 life sciences and medicine programs (Figure 24). This global recognition reflects the high-quality research and the steady pipeline of elite graduates being produced within the state.
- From 2020 to 2024, the number of life sciences degrees²⁵ awarded by colleges and universities in Pennsylvania remained steady, with 9,348 and 9,464 life sciences degrees awarded in 2021 and 2024, respectively. Biological and biomedical sciences remained the largest share of total life sciences degrees awarded, with over 7,500 graduates annually from 2021 through 2024 (Figure 25).
- When compared to identified peer states, Pennsylvania consistently produced the third-largest number of degrees in both the overall life sciences field and the biological and biomedical sciences subset from 2021 to 2024 (Figure 26).
- Pennsylvania institutions awarded 764 doctoral degrees in 2024, ranking fourth in doctoral degrees awarded compared to peer states (Figure 27). Although there is a gap between the total number of degrees awarded and the number of doctoral degrees awarded in Pennsylvania compared to leading life sciences hubs such as California, New York, and Massachusetts, Pennsylvania continues to be a steady contributor to the national talent pool.

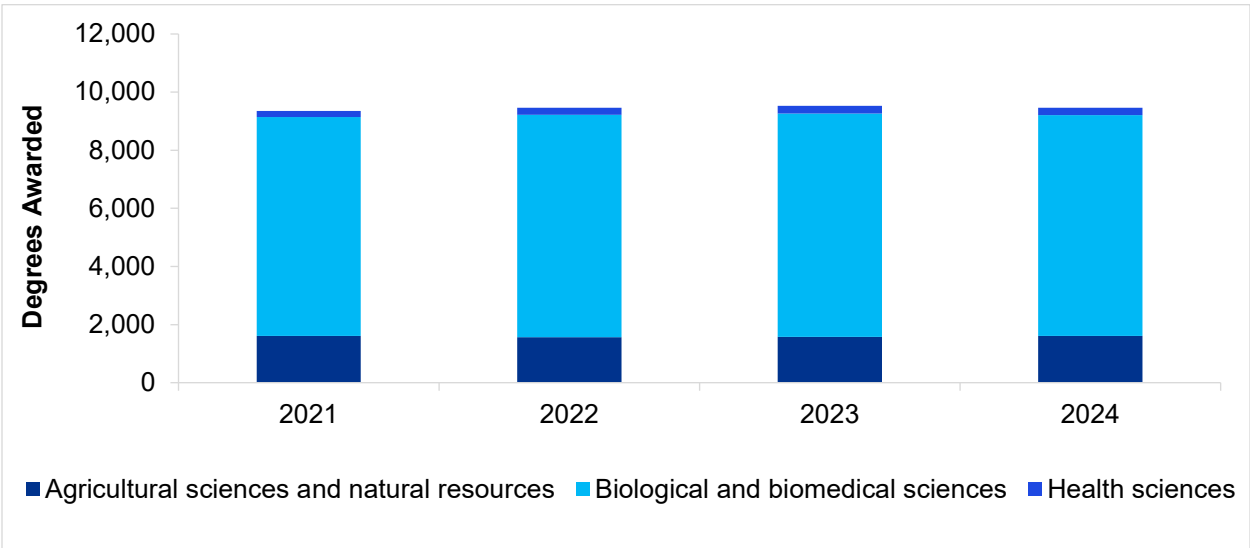
Figure 24: Number of world top 100 universities by state and number of world top 100 Life Sciences & Medicine Programs by state in 2024



Sources: Shanghai Index World University Rankings, 2024, Quacquarelli Symonds World University Rankings by Subject: Life Sciences and Medicine, 2024

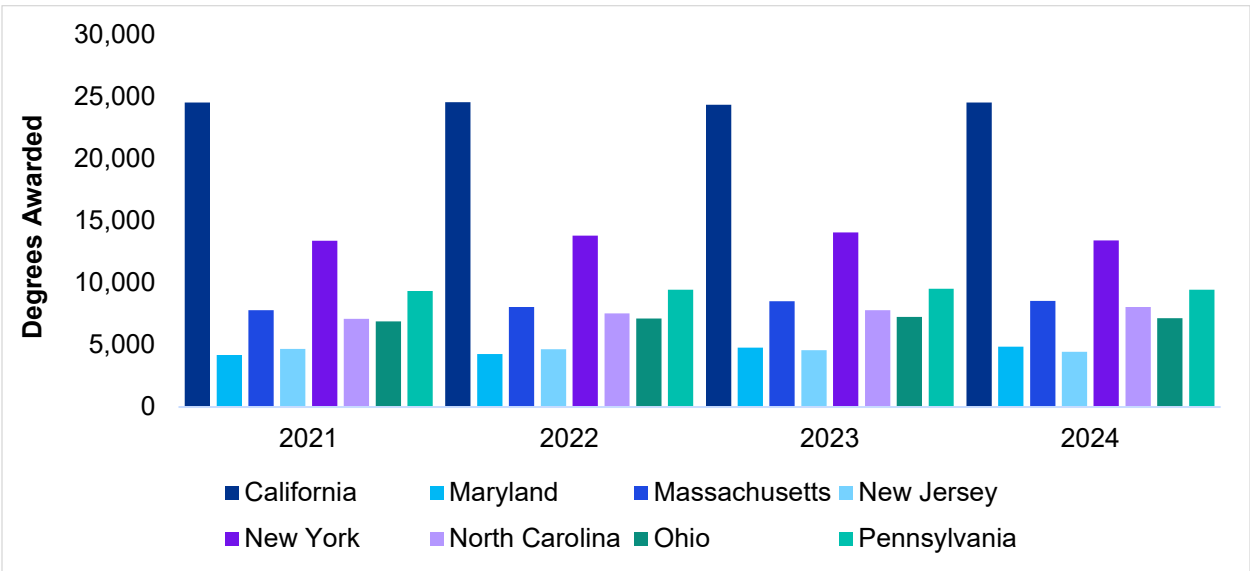
²⁵ Include bachelor's degrees, postbaccalaureate certificates, master's degrees, and doctor's degrees – research/scholarship

Figure 25: Life Sciences degrees awarded in PA from 2021 to 2024



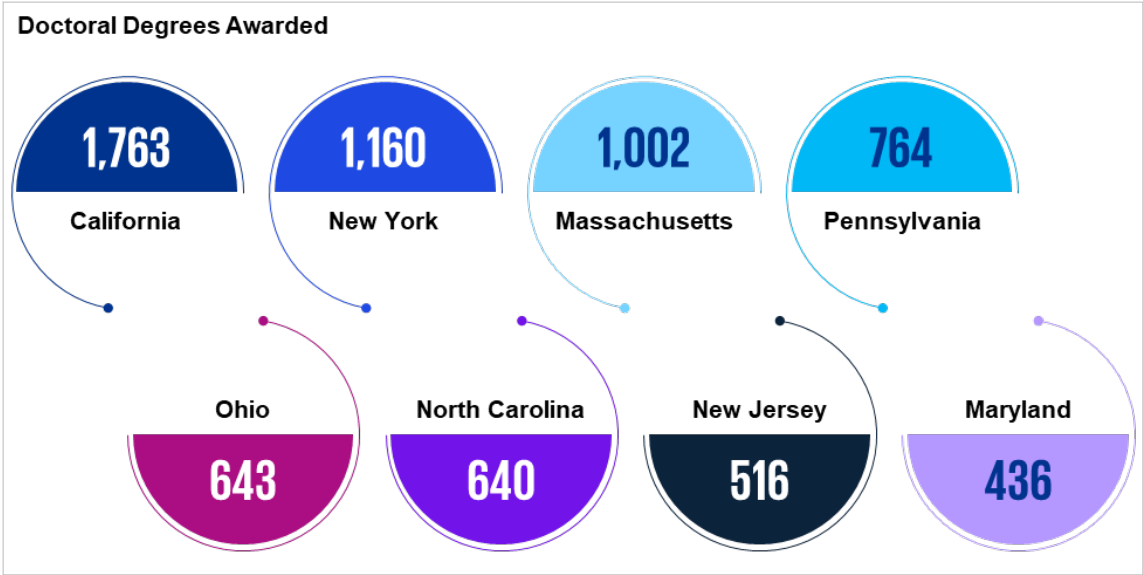
Source: NSF – NCSES, FY 2021–24

Figure 26: Life Sciences degrees awarded by Pennsylvania in comparison to peer states from 2021 to 2024



Source: NCS – NCSES, FY 2021–24

Figure 27: Doctorate recipients in the Life Sciences discipline by state in 2024



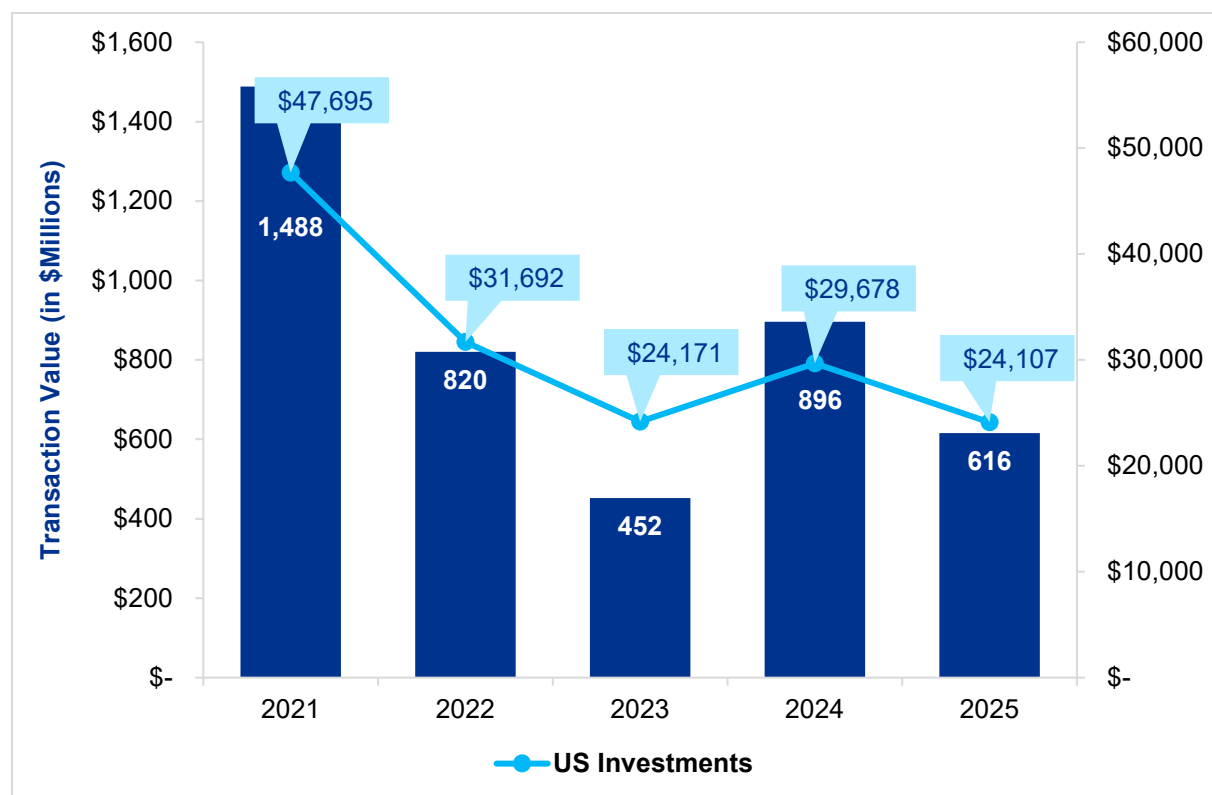
Source: NSF – NCSES, FY 2024

Attracting capital

As shown in Figure 28, venture capital investment generally in the US life sciences industry has slowed down since 2021, reflecting a broader normalization after the extraordinary funding environment that characterized the early pandemic years.

Pennsylvania follows this general national trend. In 2021, venture capital investment in the industry in Pennsylvania experienced a multi-year high, nearing \$1.5 billion, then fell nearly half in 2022 and dropped further in 2023 to roughly \$452 million. This three-year decline in Pennsylvania mirrors the broader pullback in national funding investment but with sharper swings relative to its size. From 2023 onward, venture capital investment rebounded and remained relatively resilient at around \$616 million in 2025. While these levels are still below the 2021 peak, they indicate that investors continue to back the Commonwealth's life sciences companies, with larger average deal size than during the 2021 surge.

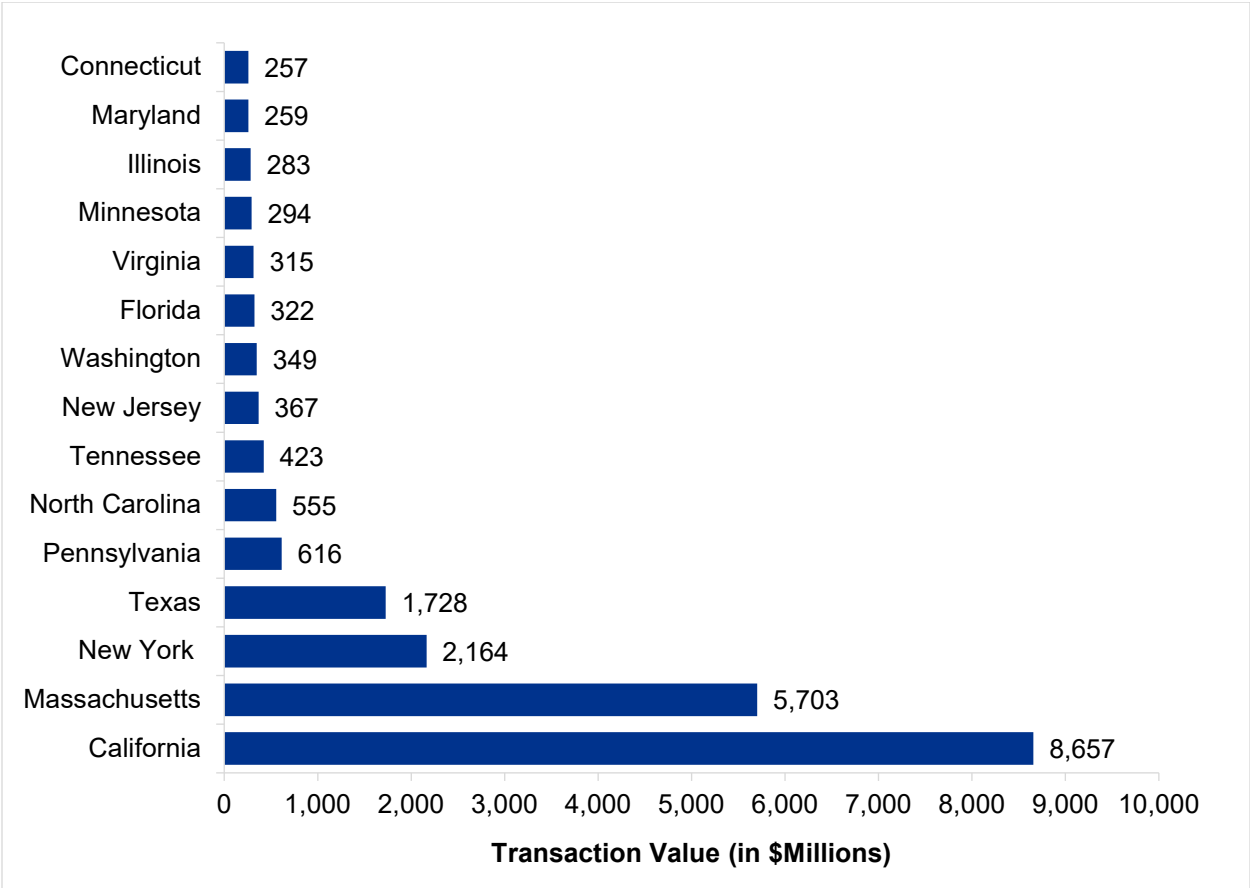
Figure 28: Total venture capital transaction value for pharmaceuticals, biotechnology and life sciences in Pennsylvania, 2021–25



Source: S&P Capital IQ Pro, 2021–25

Figure 29 presents the top 15 states with largest venture capital funding in 2025. By comparison, Pennsylvania remained in the midtier in terms of attracting venture capital investment: it trails the dominant hubs such as California, Massachusetts, and New York, but ranks ahead of or comparable to other established hubs such as North Carolina, New Jersey, and Maryland. Despite some volatility, Pennsylvania continues to attract a meaningful level of venture capital investment, underscoring its ongoing relevance as a competitive life sciences ecosystem.

Figure 29: Total venture capital transaction value for pharmaceuticals, biotechnology and life sciences in 2025, by state



Source: S&P Capital IQ Pro, 2025

Life Sciences key trends

As part of the Report, KPMG conducted a series of focus interviews with stakeholders in major markets and across a variety of leadership positions within Pennsylvania's life sciences ecosystem, including local business leaders and representatives from academic and industry organizations. The goal of the stakeholder interviews was to summarize participants' points of view on the current leading trends within the life sciences industry and document how they are evolving locally from the perspectives of market participants.

This section presents a summary of several themes and trends that were identified during the focus interviews. The overall areas that are discussed include industry trends, business and policy environment, technology adoption, and workforce training and availability.

Industry trends

Stakeholder feedback gathered during the first half of 2026 indicates that, while investment in innovative life sciences companies continues, the pace of investment has cooled in certain segments compared to prior years, including CGT. Stakeholders noted that higher production costs, long and uncertain development timelines, and manufacturing scalability considerations may be contributing to this moderation in investment, and emphasized that ongoing advances in technology and refinement to commercial models will be important to support long-term growth of this segment.

Stakeholders consistently reported that capital is increasingly concentrated in "de-risked" or more familiar investment pathways, with investors favoring fewer, later stage companies with proven clinical results. In this environment, early-stage ventures may face higher bars for securing investment, as participants have shared perceptions that investors increasingly demand clearly defined use cases, scalable pathways, and mature and well researched products at much earlier stages of development.

Stakeholders also noted that lack of available capital has been a longer-term challenge in Philadelphia. One stakeholder described Philadelphia's ecosystem as less well networked than other leading hubs. Stakeholders note that such factors may create a funding gap for new and early-stage life sciences ventures in the Commonwealth and Philadelphia region.

Stakeholder feedback also indicates that Pennsylvania's life sciences manufacturing sector is experiencing notable expansion, particularly in the southeastern region of the state. Interviewees highlighted that this growth is supported by a mix of start-ups, leading academic institutions, large-scale manufacturing operations, and corporate headquarters of major pharmaceutical companies. One interviewee pointed to the Lehigh Valley as an emerging manufacturing center for both medtech and pharmaceuticals.

Clinical trials

Across interviews, stakeholders described a globalizing clinical trial landscape and shared perceptions that perceived high costs and inefficiencies in the US have led companies to conduct trials in other countries. Multiple interviewees cited Australia and China as popular alternatives, given perceptions of generous tax incentives, accelerated timelines, large patient pools, and lower-cost trial options.

At the same time, multiple stakeholders highlighted Pennsylvania's strengths for clinical trials, including major academic medical centers, diverse patient populations, and existing research infrastructure. One participant noted the perception that increased transparency, training, and education around the clinical trial review process may require additional investment to alleviate bottlenecks that can discourage companies from conducting clinical trials within the state. They suggest that these process improvements can help the state better capitalize on these assets.

Business and policy environment

As noted in earlier comments, interviewees consistently cited securing capital as a significant challenge, especially for early-stage companies. While several state funding programs and initiatives, such as the Cure Grants and Ben Franklin Technology Partners, were cited as available to life sciences companies, several stakeholders expressed that these programs are often seen as limited in size or not well aligned with the needs of commercial ventures, reinforcing the need for stronger private sector financing. Additionally, several stakeholders expressed that there is room to streamline and simplify the process for obtaining state economic incentives, suggesting an opportunity to further enhance the Commonwealth's support for companies considering expansion within the region.

Participants also highlighted meaningful venture capital presence at networking events as a key draw for attendance, noting that in leading hubs such as San Francisco and Boston, networking events regularly may draw large numbers of venture capital investors, creating a visible, "on-the-ground" capital presence that helps deals form and companies gain momentum. Pennsylvania was described as having a relatively smaller investor presence.

A few stakeholders noted that Pennsylvania's business environment is improving, with efforts to support and attract new investments in companies. Along with these statewide initiatives, the state's diverse ecosystem, including strong academic and research institutions, strong manufacturing capabilities, and a growing presence in advanced therapies, remains a significant asset.

Technology adoption and industry shifts

The stakeholder interviewees noted that technological advancements, especially in artificial intelligence (AI), are beginning to transform the life sciences industry. Feedback from interviews indicates growing AI adoption across the life sciences industry in Pennsylvania. Many stakeholders indicated that companies are not only using these technologies for research and development but also to improve efficiency in day-to-day business functions such as sales, administrative tasks and other operational activities.

While these tools were cited as helping to streamline operations and open new possibilities, several interviewees perceived that Pennsylvania may be behind other regions in integrating AI into existing commercial products. Stakeholders commonly expressed concerns around data security and the perceived accuracy of AI outputs and emphasized that human oversight and intervention remain critical to addressing these issues effectively.

Workforce and talent development

Stakeholders described a complex workforce landscape for Pennsylvania's life sciences industry, characterized by the following trends:

Pipeline constraints in manufacturing-related roles: Interview feedback highlighted a persistent perception gap: current students often do not view manufacturing roles as attractive career paths. Simultaneously, a larger share of experienced manufacturing workers are nearing retirement, increasing

the perceived urgency of strengthening Pennsylvania’s talent pipeline, facilitating effective skills transfer, and implementing succession planning for production and technical roles.

Fragmented training system: Interviewees expressed concerns over the incoming workforce, noting that they believe current educational pathways may not sufficiently emphasize practical, hands-on experience and cross-functional preparation that employers increasingly seek. In response, several interviewees noted growing interest in comprehensive training and fellowship models that integrate technical, business, and entrepreneurial skills. Several interviewees also highlighted that certain emerging technologies and training programs developed for other sectors could be adapted for life sciences applications, and that stronger coordination across regions, sectors, and providers may be required to systematically leverage these assets to build statewide life sciences talent pipelines.

Perceived gaps in seasoned management talent: Interviewees consistently noted that scientific talent in the Commonwealth is very strong, although several cited experienced management and commercialization leaders may be in relatively shorter supply locally. Some stakeholders perceive that some Pennsylvania regions can struggle to match the depth of executive experience found in hubs such as Boston or the San Francisco Bay Area, with participants citing several regional success stories involving recruiting experienced life sciences leaders from outside of Pennsylvania. One interviewee noted that talent and intellectual property tend to migrate toward capital, and the relatively limited presence of venture investors in the region compared to hubs in California and Boston may be contributing to this gap.

Attraction, retention, and “talent drain”: Across regions, stakeholders highlight challenges in attracting and retaining talent, particularly in locations outside major metro centers. In some markets, graduates from top universities leave the region due to limited availability of high-growth roles, contributing to a perceived “talent drain” despite strong educational assets.

AI, automation and the changing entry-level landscape: Interviewees have noted that AI technology tools and automation are beginning to reshape entry-level roles, potentially reducing future demand for some traditional positions while increasing demand for workers who can integrate emerging technologies into research, clinical, and manufacturing workflows.

Regional Life

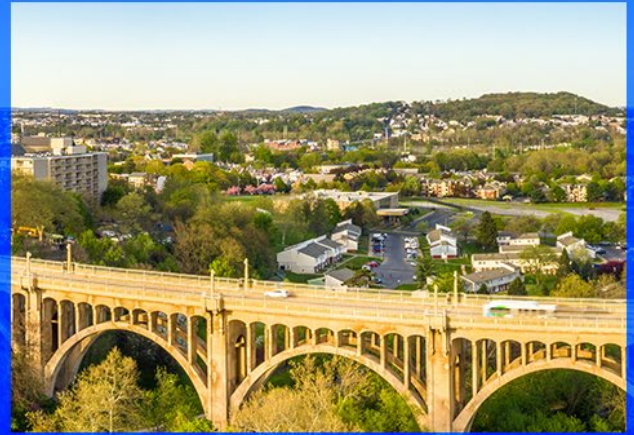
Sciences

Snapshots:

PA MSAs

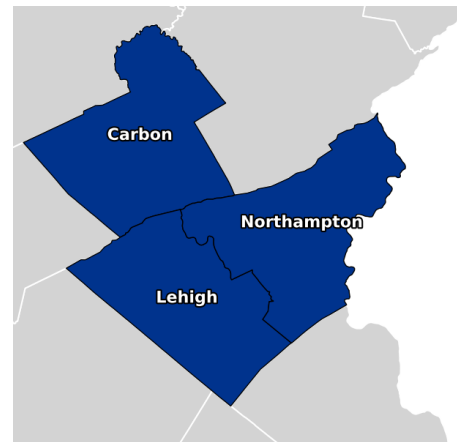
Pennsylvania Life Sciences Industry

Allentown-Bethlehem-Easton
(Lehigh Valley) spotlight



Regional strengths and unique characteristics

The Lehigh Valley is home to several pharmaceutical manufacturers.²⁶ Relative to the Commonwealth as a whole, the region has a higher concentration of life sciences activity within the wholesale trade subsector. In 2024, the region's wholesale trade subsector had a location quotient of 0.99, compared with 0.72 for the Commonwealth overall.



Industry snapshot: key statistics

Between 2021 and 2024, the life sciences industry saw modest growth in the number of establishments and rising average pay, but overall employment declined slightly.

During 2024, the industry generated nearly \$2 billion in economic output, supported a total of 6,500 jobs, and contributed \$674.5 million in labor income.

Life Sciences industry	2021 value	2024 value	Average annual growth
 Life Sciences industry location quotient	0.45	0.41	 -3.0%
 Number of establishments	155	162	 1.3%
 Employment	2,371	2,239	 -1.9%
 Average annual pay	\$112,050	\$119,740	 2.3%

²⁶ "Life Sciences in Lehigh Valley, PA | Medtech & Biotech Hub." Lehighvalley.org, 2025, www.lehighvalley.org/life-sciences/. Accessed March 2026

Life Sciences subsector	2021 establishments	2024 establishments	Average annual growth
 Research, testing, & medical laboratories	85	92	 3.0%
 Drugs and pharmaceuticals	14	15	 2.4%
 Wholesale trade	36	35	 -0.3%
 Medical devices and equipment	21	19	 -3.2%

Life Sciences subsector	2021 employment	2024 employment	Average annual growth
 Research, testing, & medical laboratories	1,010	1,128	 3.9%
 Wholesale trade	1,129	1,110	 -0.6%

Life Sciences subsector	2021 average annual pay	2024 average annual pay	Average annual growth
 Research, testing, & medical laboratories	\$126,380	\$143,240	 4.4%
 Wholesale trade	\$105,080	\$95,860	 -2.9%

Note: Employment and wage in the drugs and pharmaceuticals and medical devices and equipment subsectors are not reported in BLS QCEW due to data suppression.

Economic and fiscal contributions

Impact Type	Direct impact	Indirect + induced impact	Total impact	Multiplier
 Employment	2,200	4,300	6,500	2.92
 Labor income (\$M)	\$370.9	\$303.6	\$674.5	1.82
 Output (\$M)	\$1,093.3	\$826.3	\$1,919.7	1.76
 Tax revenue (\$M)	\$122.1	\$108.0	\$230.1	N/A

Subsector	Total employment (No. of jobs)	Total labor income (\$M)	Total output (\$M)
 Research, testing, & medical laboratories	3,600	\$402.3	\$1072.9
 Wholesale trade	2,900	\$272.2	\$846.7

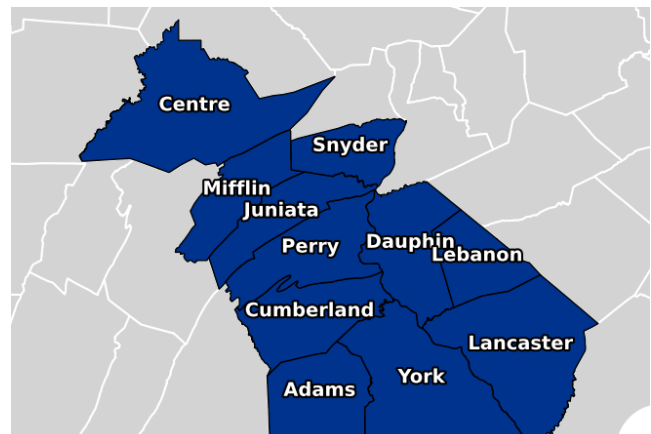
Pennsylvania Life Sciences Industry

Central Pennsylvania spotlight



Regional strengths and unique characteristics

Anchored by Penn State's main campus and research activities, the Central Pennsylvania MSA region provides access to a steady STEM talent pipeline, research-oriented activities, and supporting infrastructure relevant to the life sciences industry. Within this region, the wholesale trade subsector had the highest location quotient in 2024 at 0.25, followed by medical devices and equipment at 0.22, research, testing, & medical laboratories at 0.18. The drugs and pharmaceuticals subsector has a relatively limited presence in the region.



Industry snapshot: key statistics

From 2021 to 2024, Central Pennsylvania's life sciences industry saw modest decline in establishments. The wholesale trade subsector experienced the greatest decline, with number of establishments falling by 1.3percent annually.

During 2024, the life sciences industry supported approximately 6,700 jobs, generated \$1.7 billion in economic output, and contributed \$201.5 million in tax revenues to the local economy.

Life Sciences industry	2021 value	2024 value	Average annual growth
Life Sciences industry location quotient ¹	0.24	0.18	-8.9%
Number of establishments	294	287	-0.8%
Employment ¹	3,717	2,819	-8.1%
Average annual pay ¹	\$79,450	\$85,880	2.7%

Life Sciences subsector	2021 establishments	2024 establishments	Average annual growth
 Research, testing, & medical laboratories	142	137	 -1.2%
 Drugs and pharmaceuticals	20	22	 3.6%
 Wholesale trade	71	68	 -1.3%
 Medical devices and equipment	62	61	 -0.5%

Life Sciences subsector	2021 employment	2024 employment	Average annual growth
 Research, testing, & medical laboratories	1,973	1,332	 -10.8%
 Drugs and pharmaceuticals	9	6	 -9.3%
 Wholesale trade	952	812	 -4.9%
 Medical devices and equipment	783	668	 -4.9%

Note: Employment and wage in the research, testing & medical laboratories subsector for some counties are not reported in BLS QCEW due to data suppression.

Life Sciences subsector	2021 average annual pay	2024 average annual pay	Average annual growth
 Research, testing, & medical laboratories	\$73,630	\$79,180	 2.5%
 Drugs and pharmaceuticals	\$49,660	\$60,200	 7.1%
 Wholesale trade	\$99,400	\$101,690	 0.8%
 Medical devices and equipment	\$70,200	\$80,270	 4.8%

Economic and fiscal contributions

Impact Type	Direct impact	Indirect + induced impact	Total impact	Multiplier
 Employment	2,800	3,800	6,700	2.36
 Labor income (\$M)	\$314.1	\$252.6	\$566.7	1.80
 Output (\$M)	\$1,005.9	\$700.8	\$1,706.8	1.70
 Tax revenue (\$M)	\$108.5	\$93.1	\$201.5	N/A

Subsector	Total employment (No. of jobs)	Total labor income (\$M)	Total output (\$M)
 Research, testing, & medical laboratories	2,700	\$225.4	\$565.2
 Drugs and pharmaceuticals	29	\$2.1	\$16.0
 Wholesale trade	2,500	\$216.4	\$719.6
 Medical devices and equipment	1,500	\$122.9	\$406.0

Pennsylvania Life Sciences Industry

Philadelphia Spotlight



Regional strengths and unique characteristics

The Philadelphia region is a global leader in cell and gene therapy, supported by significant research spending and a robust R&D ecosystem anchored by leading universities and major health systems. Compared to the US as a whole, the region is relatively specialized in drugs and pharmaceuticals, research, testing & medical laboratories, and wholesale trade. In 2024, these subsectors recorded location quotients of 2.93, 1.99, and 1.09, respectively, all exceeding the corresponding statewide metrics.



Industry snapshot: key statistics

The Philadelphia region has shown steady growth, with increases in overall employment, establishments and average annual pay from 2021 to 2024.

During 2024, the industry generated \$74.3 billion in economic impact, supported 176,800 jobs, and contributed \$8.4 billion in tax revenue.

Life Sciences industry	2021 value	2024 value	Average annual growth
 Life Sciences industry location quotient	1.70	1.66	 -0.8%
 Number of establishments	1,257	1,429	 4.6%
 Employment	52,021	53,048	 0.7%
 Average annual pay	\$148,830	\$169,170	 4.6%

Life Sciences subsector	2021 establishments	2024 establishments	Average annual growth
 Research, testing, & medical laboratories	693	894	 9.6%
 Drugs and pharmaceuticals	91	86	 -1.8%
 Wholesale trade	282	272	 -1.2%
 Medical devices and equipment	191	178	 -2.3%

Life Sciences subsector	2021 employment	2024 employment	Average annual growth
 Research, testing, & medical laboratories	28,984	29,788	 0.9%
 Drugs and pharmaceuticals	13,161	12,945	 -0.5%
 Wholesale trade	6,816	7,097	 1.4%
 Medical devices and equipment	3,060	3,218	 1.7%

Life Sciences subsector	2021 average annual pay	2024 average annual pay	Average annual growth
 Research, testing, & medical laboratories	\$145,520	\$164,030	 4.2%
 Drugs and pharmaceuticals	\$165,770	\$185,680	 4.0%
 Wholesale trade	\$157,990	\$194,870	 7.8%
 Medical devices and equipment	\$86,980	\$93,680	 2.6%

Economic and fiscal contributions

Impact Type	Direct impact	Indirect + induced impact	Total impact	Multiplier
 Employment	53,000	123,700	176,800	3.33
 Labor income (\$M)	\$13,181	\$11,484	\$24,665	1.87
 Output (\$M)	\$43,781	\$30,539	\$74,320	1.70
 Tax revenue (\$M)	\$4,427	\$3,941	\$8,368	N/A

Subsector	Total employment (No. of jobs)	Total labor income (\$M)	Total output (\$M)
 Research, testing, & medical laboratories	95,200	\$12,735	\$30,274
 Drugs and pharmaceuticals	45,800	\$7,441	\$28,528
 Wholesale trade	28,600	\$3,683	\$13,197
 Medical devices and equipment	7,100	\$807	\$2,321

Pennsylvania Life Sciences Industry

Pittsburgh spotlight



Regional strengths and unique characteristics

Supported by research strengths at institutions such as Carnegie Mellon University, University of Pittsburgh, and major health systems, Pittsburgh's life sciences industry is increasingly defined by intersections among computational science, engineering, and biomedical innovation. This convergence contributes to growing activities in research, testing, and technology-enabled life sciences. Compared with the Commonwealth as a whole, the medical devices and equipment subsector is more concentrated in this region. In 2024, this subsector recorded a location quotient of 1.09, exceeding the Commonwealth's overall location quotient of 0.98 in this subsector.



Industry snapshot: key statistics

The Pittsburgh's life sciences industry demonstrated steady growth from 2021 to 2024, with increases in industry concentration, the number of establishments, employment, and average annual pay. Both establishments and employment expanded at an average annual rate of 0.9 percent.

During 2024, the life sciences industry contributed over \$11 billion in total economic output, supported nearly 40,000 jobs, and generated \$1.4 billion in tax revenues.

Life Sciences industry	2021 value	2024 value	Average annual growth
 Life Sciences industry location quotient	0.77	0.78	 0.5%
 Number of establishments	553	568	 0.9%
 Employment	13,706	14,075	 0.9%
 Average annual pay	\$102,160	\$118,460	 5.3%

Life Sciences subsector	2021 establishments	2024 establishments	Average annual growth
 Research, testing, & medical laboratories	290	289	 -0.1%
 Drugs and pharmaceuticals	16	19	 6.3%
 Wholesale trade	143	149	 1.4%
 Medical devices and equipment	104	111	 2.2%

Life Sciences subsector	2021 employment	2024 employment	Average annual growth
 Research, testing, & medical laboratories	7,987	8,025	 0.2%
 Drugs and pharmaceuticals	169	175	 1.2%
 Wholesale trade	2,193	2,137	 -0.8%
 Medical devices and equipment	3,357	3,738	 3.8%

Life Sciences subsector	2021 average annual pay	2024 average annual pay	Average annual growth
 Research, testing, & medical laboratories	\$109,500	\$133,250	 7.2%
 Drugs and pharmaceuticals	\$106,560	\$103,060	 -1.1%
 Wholesale trade	\$97,150	\$98,870	 0.6%
 Medical devices and equipment	\$87,770	\$98,630	 4.1%

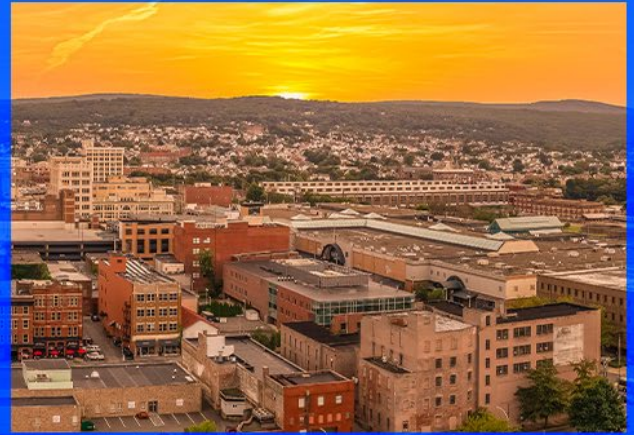
Economic and fiscal contributions

Impact Type	Direct impact	Indirect + induced impact	Total impact	Multiplier
 Employment	14,100	25,800	39,900	2.83
 Labor income (\$M)	\$2,211.5	\$2,009.9	\$4,221.4	1.91
 Output (\$M)	\$6,070.2	\$5,633.4	\$11,703.6	1.93
 Tax revenue (\$M)	\$672.4	\$757.6	\$1,430.0	N/A

Subsector	Total employment (No. of jobs)	Total labor income (\$M)	Total output (\$M)
 Research, testing, & medical laboratories	24,000	\$2,591.8	\$6,685.4
 Drugs and pharmaceuticals	570	\$75.9	\$288.7
 Wholesale trade	6,100	\$600.9	\$1,778.2
 Medical devices and equipment	9,200	\$952.8	\$2,951.3

Pennsylvania Life Sciences Industry

Scranton/Wilkes-Barre-Hazleton spotlight



Regional strengths and unique characteristics

The Scranton/Wilkes-Barre-Hazleton MSA region has experienced growth in life sciences whole trade activities over time. From 2021 to 2024, the location quotient for the wholesale trade subsector increased markedly from 0.25 to 0.96. Compared with the Commonwealth as a whole, this subsector has become relatively more concentrated in the region. This expansion in life-sciences related wholesale is consistent with an emerging manufacturing and supply chain cluster that supports the life sciences industry's growth in Pennsylvania more broadly.



Industry snapshot: key statistics

Compared to other MSAs, the Scranton/Wilkes-Barre-Hazleton region has a relatively smaller life sciences industry presence. From 2021 to 2024, the life sciences industry's employment grew from 1,136 to 1,567 jobs, with much of this growth concentrated in the wholesale trade subsector.

During 2024, the life sciences industry in the MSA supported 3,400 jobs, generated \$806.3 million in output, and contributed \$105.7 million in tax revenue.

Life Sciences industry	2021 value	2024 value	Average annual growth
 Life Sciences industry location quotient	0.29	0.38	 10.8%
 Number of establishments	105	101	 -1.3%
 Employment	1,136	1,567	 12.6%
 Average annual pay	\$64,120	\$76,420	 6.4%

Life Sciences subsector	2021 establishments	2024 establishments	Average annual growth
 Research, testing, & medical laboratories	55	53	 -1.5%
 Drugs and pharmaceuticals	4	5	 8.3%
 Wholesale trade	27	31	 5.4%
 Medical devices and equipment	19	12	 -12.3%

Life Sciences subsector	2021 employment	2024 employment	Average annual growth
 Research, testing, & medical laboratories	924	759	 -5.95%
 Wholesale trade	195	807	 104.8%

Life Sciences subsector	2021 average annual pay	2024 average annual pay	Average annual growth
 Research, testing, & medical laboratories	\$58,870	\$65,570	 3.8%
 Wholesale trade	\$91,170	\$86,640	 -1.7%

Note: Employment and wage in the drugs and pharmaceuticals and medical devices and equipment subsectors are not reported in BLS QCEW due to data suppression.

Economic and fiscal contributions

Impact Type	Direct impact	Indirect + induced impact	Total impact	Multiplier
 Employment	1,600	1,900	3,400	2.18
 Labor income (\$M)	\$156.7	\$105.9	\$262.6	1.68
 Output (\$M)	\$498.3	\$308.0	\$806.3	1.62
 Tax revenue (\$M)	\$64.0	\$41.7	\$105.7	N/A

Subsector	Total employment (No. of jobs)	Total labor income (\$M)	Total output (\$M)
 Research, testing, & medical laboratories	1,200	\$92.0	\$215.1
 Wholesale trade	2,200	\$170.5	\$591.2

Methodology appendix

Data sources

To help ensure a detailed analysis, we evaluated an extensive range of longitudinal data, as listed in Table 8, to provide a holistic overview of the life sciences industry in Pennsylvania and its peer states.

Table 8: Data sources

Data source	Years covered
Pennsylvania Life Sciences snapshot	
QCEW, BLS	2021 and 2024
US Census Bureau	2022
Dun & Bradstreet	2024
Wavteq	2022 to 2025
Commonwealth support	
Pennsylvania Department of Revenue	2025
PA Life Sciences Greenhouses	2023
Pennsylvania Department of Community & Economic Development	2015 to 2025
Commonwealth of Pennsylvania	Fiscal Year 2026-27
Ben Franklin Technology Partners	2025
Research excellence	
NIH	Fiscal Year 2024
NSF	Fiscal Year 2021 to 2024
US Census Bureau	2024
NSF analysis of USPTO data	2018 to 2022
USPTO	2018 to 2022
National Library of Medicine	2019 to 2024
Economic contribution	
IMPLAN	2024
Academic contribution	
Shanghai Index World University Rankings	2024

Data source	Years covered
Quacquarelli Symonds World University Rankings by Subject	2024
NSF	Fiscal Year 2021 to 2024
Attracting capital	
S&P Capital IQ Pro	2025

Life sciences definition by NAICS codes

Table 9 below outlines the specific NAICS codes that comprise life sciences for the purposes of this Report.

Table 9: Life sciences definition by NAICS codes

NAICS	Sector name	Share allocation
Drugs and pharmaceuticals		
325411	Medicinal and Botanical Manufacturing	100%
325412	Pharmaceutical Preparation Manufacturing	100%
325413	In-Vitro Diagnostic Substance Manufacturing	100%
325414	Biological Product (except Diagnostic) Manufacturing	100%
112310	Chicken Egg Production	1.7%**
Medical devices and equipment		
325220	Artificial and Synthetic Fibers and Filaments Manufacturing	100%
333314	Optical Instrument and Lens Manufacturing	100%
334510	Electro medical and Electrotherapeutic Apparatus Manufacturing	100%
334516	Analytical Laboratory Instrument Manufacturing	100%
334517	Irradiation Apparatus Manufacturing	100%
339112	Surgical and Medical Instrument Manufacturing	100%
339113	Surgical Appliance and Supplies Manufacturing	100%
339114	Dental Equipment and Supplies Manufacturing	100%
339115	Ophthalmic Goods Manufacturing	100%
339116	Dental Laboratories	100%

NAICS	Sector name	Share allocation
Wholesale trade		
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers	100%
423460	Ophthalmic Goods Merchant Wholesalers	100%
424210	Drugs and Druggists' Sundries Merchant Wholesalers	68.0%*
Research, testing, & medical laboratories		
541380	Testing Laboratories	10.7%*
541714	Research and Development in Biotechnology (except Nanobiotechnology)	100%
541713	Research and Development in Nanotechnology	60%*
541715	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	58%*
611310	Colleges, Universities, and Professional Schools	6.9%***
621511	Medical Laboratories	100%
621512	Diagnostic Imaging Centers	100%

* Sectors that have less than 100 percent share allocation have activity that is less than 100 percent attributable to the life sciences industry for the purposes of this Report. Sectors' shares attributable to the life sciences industry were derived from the 2022 Economic Census from the US Census Bureau (the last year for which complete data is available at the time of this Report's preparation).

** For Sector 112310, Chicken Egg Production, share attributable to the life sciences industry was derived using: (1) annual egg production data from the US Department of Agriculture, (2) number of vaccines using eggs as per the Centers for Disease Control and Prevention, and (3) number of eggs per vaccine dose as reported in Manini et al. (2017) .²⁶

*** For Sector 611310, Colleges, Universities, and Professional Schools, the sector share attributable to the life sciences industry was derived using data on bachelor's, master's, and doctorate degrees awarded from the NSF's NCSES.

²⁶ Manini, Ilaria et al., "Egg-Independent Influenza Vaccines and Vaccine Candidates." *Vaccines*, 5(3), 18. July 18 2017. doi:10.3390/vaccines5030018

Employment data

To measure the economic contribution of the life sciences industry to Pennsylvania's economy, this analysis uses employment data from the BLS as an input into the model. The data is from the QCEW for the year 2021 and 2024 (the latest complete annual data available at the time this Report was prepared). The QCEW dataset includes employment and wage information reported directly by employers and covers more than 95.0 percent of US jobs at the national, state, and metropolitan statistical area, and county level. Data is aggregated starting at the six-digit NAICS industry level.

IMPLAN methodology

Economic contribution analysis recognizes the interdependence among different sectors of the economy by quantifying the direct and indirect economic contributions, including the induced impact, of companies' or industry presence as measured by economic output, employment, labor income, and taxes of spending associated with an activity/event/project on a local, state, or US economy. Using IMPLAN²⁷ to quantify the direct, indirect, and induced impacts²⁸ of Pennsylvania's life sciences industry, the true value and support that the industry provides to the region is shown through the resulting measures.

- Economic output: the total value of goods and services produced by the life sciences industry and its supply chain.
- Employment: annual average of full-time, part-time, and seasonal employment in the life sciences industry and its supply chain
- Labor income: all forms of employment income including employee compensation and proprietor income (fully loaded compensation) paid to the life sciences employees.
- Taxes: total taxes generated by the economic activities attributable to the life sciences industry and its supply chain at each level of the government: federal, county, subcounty general, subcounty special district, and state.

²⁷ IMPLAN model, 2024 model, using inputs provided by the user and IMPLAN Group LLC, IMPLAN System (data and software), 16905 Northcross Drive, Suite 120, Huntersville, NC 28078
www.IMPLAN.com

²⁸ Direct effects refer the economic effects stemming directly from the actions of the life sciences industry. Indirect effects refer to the economic effects stemming from business-to-business purchases in the supply chain. Induced effects refer to the economic effects stemming from household spending of labor income in Pennsylvania (after removal of taxes, savings, and commuter income).

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