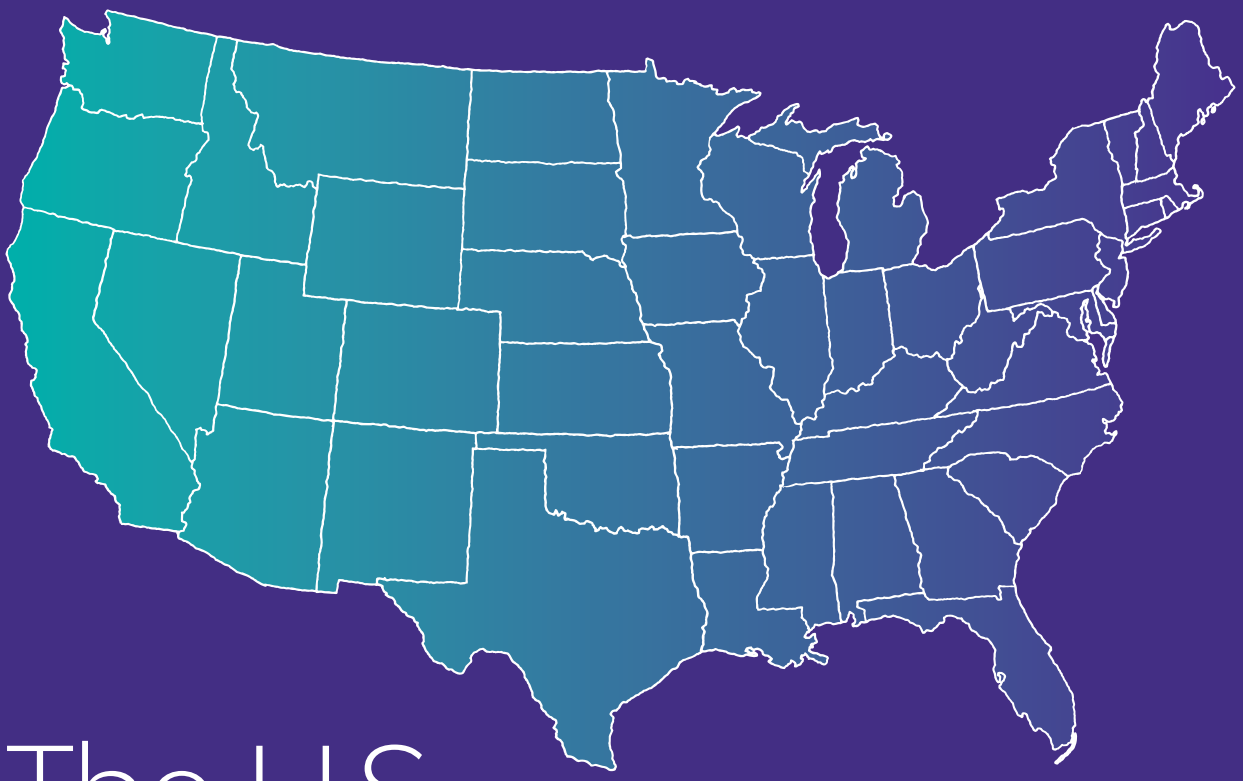
TECONOMY / BIO 2026



The U.S. Bioscience Economy:

Advancing Innovation and Strengthening States and Regions

TECONOMY PARTNERS LLC

CSBA
Council of State Bioscience Associations

Bio
Biotechnology Innovation Organization

BIO is the premier biotechnology advocacy organization representing biotech companies, industry leaders, and state biotech associations in the United States and more than 35 countries around the globe. BIO members range from biotech start-ups to some of the world's largest biopharmaceutical companies – all united by the same goal: to develop medical and scientific breakthroughs that prevent and fight disease, restore health, and improve patients' lives. BIO also organizes the BIO International Convention and a series of annual conferences that drive partnerships, investment, and progress within the sector. Learn more at bio.org.

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Introduction, Highlights, and Key Findings

The U.S. bioscience industry occupies a distinct position at the intersection of innovation, economic growth, and solutions to major societal challenges. Its companies apply scientific advancements to develop new therapies, diagnostics, medical technologies, agricultural products, industrial processes, and biobased solutions that improve health and quality of life, strengthen food and agricultural systems, and support a sustainable economy.

At the same time, the industry generates high-value employment, substantial economic activity and outsized impact, and innovation assets that are important to states and regions across the United States.

This report marks the twelfth edition in a biennial series developed by BIO and TEConomy Partners since 2004. It provides an updated assessment of the U.S. bioscience industry and its supporting innovation ecosystem at the national, state, and metropolitan-area levels. The analysis examines industry employment, establishments, wages, and economic impacts, as well as key ecosystem measures including university bioscience research and development, National Institutes of Health funding, patenting, and venture capital investment. It includes special assessments on clinical trials activity and national biomanufacturing growth dynamics. Further, it profiles the position and recent performance of states and metropolitan areas across the industry's five major subsectors.

The 2026 findings reflect a more mixed operating environment compared with the strong post-pandemic expansion documented in the prior report. The industry added jobs from 2021 through 2025 and expanded its establishment base substantially, but this four-year trend that is the focus for this edition contains two distinct sub-periods. Rapid post-pandemic hiring and continued, though slowing, growth gave way to an employment plateau in 2024 and 2025. National bioscience employment declined slightly in 2024 and increased only modestly in 2025, closely mirroring the slower pace of overall private sector hiring. These trends, together with ongoing pressures on early-stage financing, federal research funding, and other ecosystem elements, warrant continued attention. Continuing to bolster the industry and its supporting innovation ecosystem is essential to sustaining long-term American leadership and competitiveness in bioscience discovery, development, and advanced manufacturing.

In 2025, the U.S. Bioscience Industry represents:

- 2.31 million employees across more than 156,000 business establishments
- $3.19 trillion in total U.S. economic output impacts
- $145,188 average annual wage—84 percent above the overall private sector average

Even amid these headwinds, the bioscience industry remains a major national economic asset and a significant development opportunity for states and regions. The industry employs highly skilled workers at wages far above the national private sector average, supports extensive supply chains and multiplier effects, and sustains a broad geographic footprint across all 50 states, the District of Columbia, and Puerto Rico. Its diverse mix of research, manufacturing, testing, dis-

tribution, and related activities means that states and regions can target and grow the bioscience economy through different combinations of existing industry, workforce, university, clinical, and innovation assets.

This report, together with the accompanying state profiles, continues to document the bioscience industry's reach, performance, and economic significance across the United States. It also highlights the importance of sustaining the research, talent, capital, clinical, and commercialization infrastructure needed to ensure that the nation's bioscience industry can continue to generate new innovations and broad-based economic benefits in the years ahead.

National Bioscience Industry Highlights & Key Findings

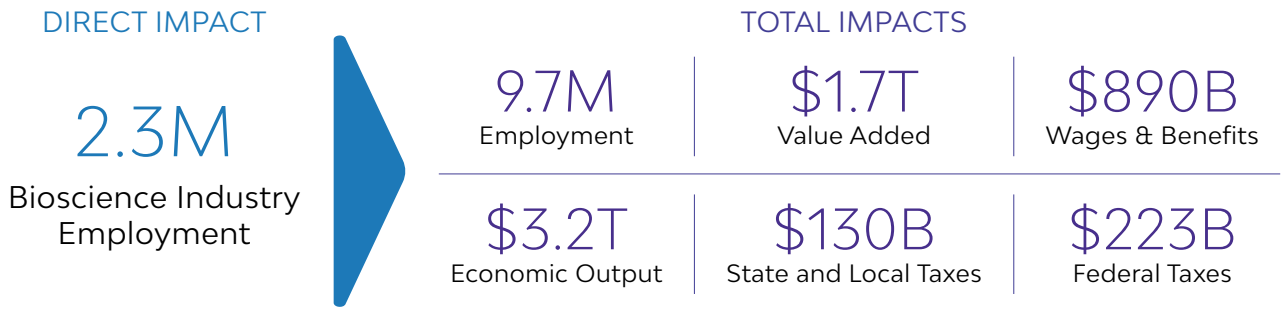
The U.S. bioscience industry remains a major innovation-driven and high-value component of the national economy. The industry continued to expand overall from 2021 through 2025, but recent performance reflects a distinct shift from the rapid post-pandemic hiring of 2022 toward an employment plateau in 2024 and 2025. The industry nevertheless continues to generate and support high-wage employment, extensive supply chain activity, and substantial national economic impacts.

- In 2025, bioscience companies employed 2.31 million Americans across more than 156,000 business establishments in all 50 states, the District of Columbia, and Puerto Rico. From 2021 through 2025, industry employment increased by 7.0 percent and establishments increased by 22 percent.
- The overall employment gain over the four-year reference period masks two distinct sub-periods. Industry employment rose 5.7 percent in 2022 and increased another 1.2 percent in 2023 before declining 0.3 percent in 2024 and growing just 0.4 percent in 2025. Employment in 2025 was essentially unchanged from its 2023 level.
- The recent hiring slowdown closely mirrored broader private sector trends. Total private sector employment grew 1.0 percent in 2024 and 0.4 percent in 2025, indicating that bioscience employers were operating in an overall cooling national labor market rather than continuing the clear employment growth advantage typically seen from the industry.
- Performance varied across the five major bioscience subsectors. Bioscience-related distribution and pharmaceutical manufacturing continued to add jobs in 2025, while research, testing, and medical laboratories; medical devices and equipment; and agricultural feedstock and industrial biosciences recorded modest employment declines.
- Bioscience workers earned $145,188 annually, on average, in 2025—$66,325, or 84 percent, above the overall private sector average. Every major bioscience subsector paid average wages above the private sector average, reflecting the industry's high-value activities and demand for skilled scientific, technical, engineering, production, quality, regulatory, and other specialized talent.
- The industry's total economic impact on the U.S. economy, as measured by output, totaled $3.19 trillion in 2025 (Figure 1). Bioscience industry operations generated $1.44 trillion in direct output and supported a total of 9.67 million jobs nationwide through direct, indirect, and induced effects.
- The industry generated and supported $1.69 trillion in value added in 2025, accounting for 6.2 percent of U.S. private sector GDP.[1] Its direct employment, supplier purchases, capital investments, and the spending of its highly compensated workforce also generated an estimated $55 billion in local and county taxes, $75 billion in state taxes, and $223 billion in federal taxes.

1 Value added represents the difference between an industry's total output and the cost of its purchased inputs; it includes personal income, taxes, and other property income (including profit). It is also considered to be the industry's contribution to gross state or gross domestic product (GSP or GDP). Other definitions and concepts related to the industry's economic impacts are included in that section of the report.

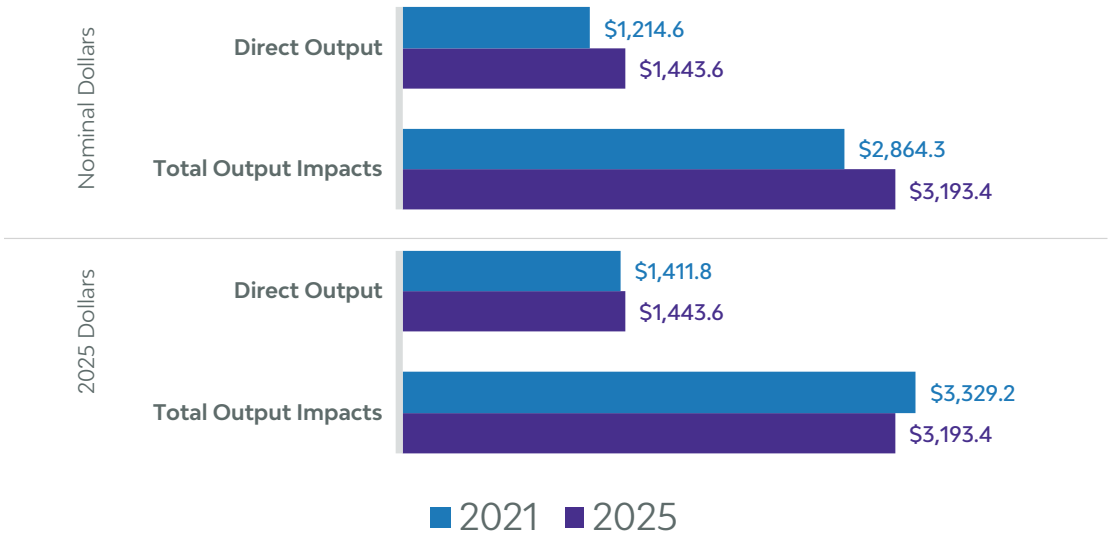
- The bioscience industry's total economic output impacts increased by $329 billion, or 11 percent, from 2021 through 2025, reaching $3.19 trillion. After adjusting for inflation, however, total output impacts declined by 4 percent, while the industry's direct output increased modestly in real terms (Figure 2).

Figure 1. Economic Impacts of the U.S. Bioscience Industry, 2025



Note: For detailed definitions and a discussion of the concepts used in the economic impact analysis, see the impact section beginning on page 14 of this report as well as the Appendix.
Source: TEConomy data and analysis using IMPLAN Economic Impact Models (U.S. & PR).

Figure 2. Economic (Output) Impacts of the U.S. Bioscience Industry, 2021 and 2025 ($B)



Source: TEConomy data and analysis using IMPLAN Economic Impact Models (US & PR). U.S. Bureau of Labor Statistics CPI Inflation Calculator.

State and Metropolitan Area Industry Highlights & Key Findings

The U.S. bioscience industry has an extensive and diverse geographic footprint. Industry activity, employment growth, and specialization extend well beyond the largest established hubs, creating varied opportunities for states and metropolitan areas to build upon existing industry, research, clinical, workforce, and supply chain assets.

- Thirty-two states and Puerto Rico have a specialized employment concentration in at least one of the five major bioscience subsectors in 2025. Agricultural feedstock and industrial biosciences has the largest number of specialized states, followed by medical devices and equipment and pharmaceuticals.
- Eight states and Puerto Rico have specialized employment concentrations in three or more bioscience subsectors: Illinois, Indiana, Minnesota, Nebraska, New Jersey, North Carolina, Puerto Rico, South Dakota, and Utah. North Carolina and Puerto Rico each have specializations in four subsectors.
- Despite the recent national employment plateau, bioscience job growth was broadly distributed over the full 2021–25 period. Forty-one states, the District of Columbia, and Puerto Rico experienced net bioscience employment growth, led in absolute job gains by Texas, Florida, Massachusetts, Illinois, North Carolina, Pennsylvania, New York, Ohio, and New Jersey.
- More than half of metropolitan areas have a specialized employment concentration in at least one bioscience subsector. Of 387 metropolitan areas with bioscience employment, 206—or 53 percent—can claim a specialized concentration.
- Twenty-three metropolitan areas have specialized employment concentrations in at least three of the five bioscience subsectors. Five regions—Boulder, Colorado; Durham–Chapel Hill, North Carolina; Madison, Wisconsin; Salt Lake City–Murray, Utah; and Santa Maria–Santa Barbara, California—have specializations in four subsectors.

Innovation Ecosystem Assessment Highlights & Key Findings

The bioscience industry's long-term performance depends upon a robust innovation ecosystem that supports scientific discovery, research translation, clinical development, intellectual property creation and protection, and access to capital. The latest assessment presents a mixed picture: university bioscience research continued to expand, clinical research activity remains broad-based, and venture investment has begun to recover from its post-pandemic lows; however, NIH funding, early-stage financing conditions, and recent employment trends highlight important challenges for the ecosystem.

- *University Bioscience R&D Reaches a New High in 2024.* U.S. academic R&D expenditures in bioscience-related fields reached $68.9 billion in 2024, up 28 percent—or $15.0 billion—from 2021. Spending increased 7.5 percent from 2023 to 2024, following a 10.1 percent increase in the prior year.
- *NIH Research Funding Declines Following Its 2023 Peak.* NIH extramural research and related funding reached $38.0 billion in FY 2023, then declined to $37.1 billion in FY 2024 and $36.7 billion in FY 2025. The FY 2025 total was 3.4 percent below the FY 2023 peak but slightly above the FY 2021 funding level.
- *Clinical Trials Represent a National Asset for Advancing Bioscience Innovation.* The special analysis conducted for this report identified 63,468 distinct clinical studies active in the United States or Puerto Rico during 2021–25. Universities, hospitals, research institutes, and other research organizations sponsored 66 percent of these studies, while industry sponsored an additional 29 percent. Clinical research activity reached every state, the District of Columbia, and Puerto Rico, though the scale and accessibility of trials varied substantially by geography.
- *Bioscience Patenting Reflects Breadth of U.S. Innovation and Diverse State Strengths.* Patent awards varied over the 2021–25 period, declining through 2023 before rising in 2024 and moderating in 2025. Medical and surgical devices remain the largest patent segment, with drugs and pharmaceuticals, biochemistry, microbiology and enzymes, bioinformatics and health IT, and agricultural technologies also representing important areas of U.S. innovation.
- *Bioscience Venture Capital Investment Shows a Modest Rebound from Post-Pandemic Lows.* Following the record investment levels of 2021 and subsequent declines in 2022 and 2023, bioscience venture investment increased in 2024 and again in 2025, reaching $55.4 billion. The recovery, however, has been uneven—later-stage companies accounted for 59 percent of investment dollars over the full 2021–25 period, while BIO's 2025 emerging biotech assessment found that Series A-1 investment in biopharma was flat from 2023 to 2024 and weakening in 2025, highlighting continued financing constraints for emerging firms.[2]

2 BIO, "The State of Emerging Biotech Companies: Investment, Deal, and Pipeline Trends," June 2025.

The U.S. Bioscience Industry Reaches an Employment Plateau Following Strong Post-Pandemic Growth

The U.S. bioscience industry has long represented an important engine of national and state economic growth, combining high-value research, development, manufacturing, testing, and distribution activities with a broad base of high-wage employment.

Across the nearly 25 years tracked in this report, the industry has consistently expanded faster than the nation's overall private sector and has shown particular resilience during periods of national economic disruption. The industry maintained relatively stable employment through the Great Recession, continued to advance through the COVID-19 pandemic, and played a critical role in developing, manufacturing, testing, and distributing vaccines, diagnostics, therapeutics, and other essential products.

The most recent four-year trend, however, presents a mixed picture. The bioscience industry added nearly 152,000 jobs from 2021 through 2025 (the reference period for this report), increasing employment by 7.0 percent to reach more than 2.31 million workers nationwide (Figure 3). The industry's establishment base expanded even more strongly, increasing 22 percent to more than 156,000 individual U.S. business establishments. These gains reflect the strong hiring and business expansion that followed the pandemic period, particularly in 2022, when bioscience employment increased 5.7 percent.

The overall net job gain since 2021 masks two very different sub-periods of industry performance. In the first, bioscience employers expanded payrolls rapidly in 2022 and continued to add jobs in 2023, though at a much more moderate 1.2 percent pace. The subsequent period has been marked by a clear employment plateau. National bioscience employment declined slightly by 0.3 percent in 2024, followed by only a 0.4 percent increase in 2025. In practical terms, the industry employed 2.31 million workers in both 2023 and 2025.

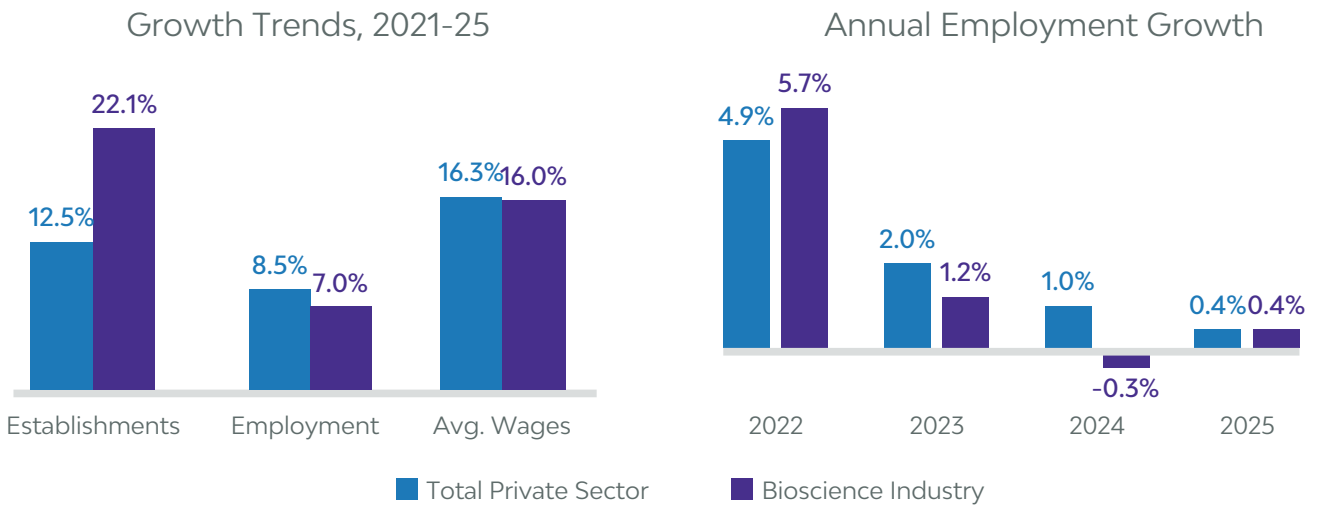
The 2023 through 2025 period has been marked by a clear employment plateau. National bioscience employment declined slightly by 0.3 percent in 2024, followed by only a 0.4 percent increase in 2025. In practical terms, the industry employed 2.31 million workers in both 2023 and 2025.

These trends closely mirrored overall private sector hiring patterns.

The hiring slowdown warrants attention. Rather than continuing the growth trajectory that characterized the immediate post-pandemic period, bioscience employers have generally stabilized their workforces and become more selective and "strategic" in hiring.[3] The industry's 2024 employment decline and modest 2025 gain closely mirrored overall private sector hiring patterns, which increased 1.0 percent in 2024 and just 0.4 percent in 2025. The bioscience industry therefore remained broadly in step with a cooling national labor market in the latest two years, rather than providing the clear employment growth advantage observed in most prior periods.

3 TEConomy/Life Sciences Workforce Collaborative (LSWC), "Life Sciences Workforce Trends: Evaluating Industry Talent Dynamics Amid Slower Growth and Rapid Technology Advances," June 2025.

Figure 3. Employment, Establishment, and Wage Trends for the U.S. Bioscience Industry, 2021-2025



Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Several interrelated forces have contributed to this more cautious operating environment. The rapid expansion in hiring and investment during and immediately following the pandemic was followed by higher inflation, interest rates, more constrained access to risk capital, pressure on public biotechnology valuations, and ongoing company efforts to prioritize capital-efficient R&D programs.[4,5] More recently, companies have also faced uncertainty surrounding trade and supply chain conditions, potential changes in the cost and availability of imported inputs, policy and regulatory conditions, and access to specialized international talent. These factors can influence decisions to expand facilities, initiate new research programs, raise capital, and add staff—particularly for smaller and earlier-stage firms with limited resources and long development timelines. At the same time, bioscience companies continue to implement productivity-enhancing automation and digital manufacturing capabilities, as well as significant investments in AI across business and operational functions, all with implications for hiring and talent demand dynamics.

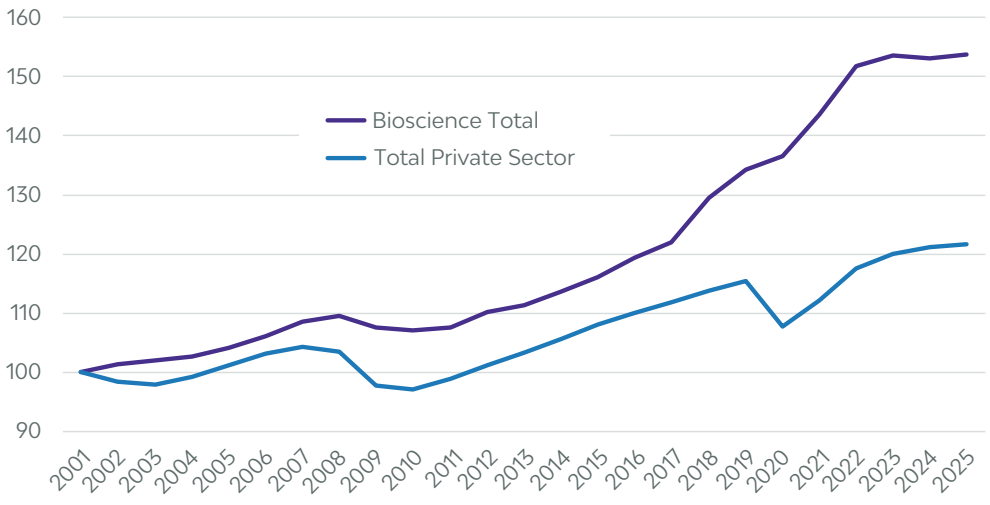
Still, the latest employment plateau should be placed in the context of the industry's longer-run economic role and relative performance, as well as major forward-looking investments and announced expansions, particularly in the biopharmaceutical manufacturing sector.

The long-term trend continues to distinguish the bioscience industry from much of the broader economy. Since 2001, bioscience employment has increased by approximately 54 percent, compared with about 22 percent growth in total private sector employment (Figure 4). This long-run performance reflects the essential nature of the industry's products and services, its sustained innovation intensity, and its deep connections to demographic, health, agricultural, industrial, and environmental needs and global challenges. The industry has repeatedly demonstrated an ability to adapt and generate economic value through changing market cycles. The current plateau is therefore an important near-term signal—not a reversal of the industry's fundamental national importance or its longer-run growth trajectory.

4 Ibid.

5 TEConomy/BIO, "The U.S. Bioscience Economy: Driving Economic Growth and Opportunity in States and Regions," 2024.

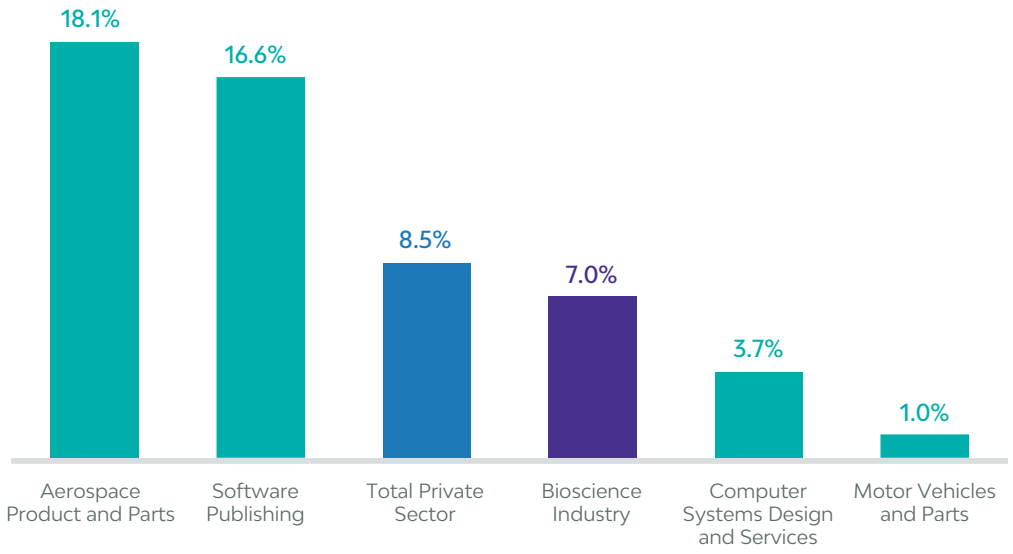
Figure 4. Employment Growth Trends for the U.S. Bioscience Industry and Private Sector, 2001-25, Employment Index (2001 = 100)



Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Although the bioscience industry has faced a more challenging hiring environment in the latest two years, the industry's employment performance over the full 2021–25 period remains broadly competitive with other advanced industries and tech-intensive sectors (Figure 5). Bioscience employment increased 7.0 percent, outpacing growth in computer systems design and related services (3.7 percent) and motor vehicles and parts (1.0 percent). Growth trailed the particularly strong gains in aerospace products and parts (18.1 percent, following its recent trough in 2021) and software publishing (16.6 percent), as well as overall private sector growth of 8.5 percent.

Figure 5. Employment Growth Trends—Biosciences vs. Other Advanced Industries, 2021-2025



Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

The recent employment plateau has not affected all parts of the bioscience industry in the same way. The five major subsectors vary considerably in their underlying markets, business models, capital requirements, and relationships to broader healthcare, manufacturing, agricultural, and technology trends.

- Over the full 2021–25 period, each subsector added jobs, although growth ranged from 1.9 percent in medical devices and equipment to nearly 11 percent in bioscience-related distribution (Figure 6).
- Notably, performance diverged in the latest year: bioscience-related distribution and pharmaceuticals continued to add jobs, while research, testing, and medical laboratories; medical devices and equipment; and agricultural feedstock and industrial biosciences were essentially flat, with just modest employment declines of less than 1 percent each (Figure 7).

Defining the Bioscience Industry: Five Major Subsectors

Defining the bioscience industry is inherently challenging given its diverse technologies, products, markets, research and development focus, and range of company types. The industry includes firms engaged in advanced manufacturing, scientific research, testing, and technology-enabled services, linked by their application of life sciences knowledge and understanding of how living organisms function. At a practical level, no single federal industry classification captures the full breadth of the biosciences. Instead, multiple detailed industries—spanning research, manufacturing, distribution, and related activities—must be combined to organize and track the industry's blend of activities.

The TEConomy/BIO biennial reports have developed an evolving set of major aggregated subsectors that group the bioscience industry into five key components, including:

Agricultural feedstock and industrial biosciences—Firms engaged in agricultural research and development, processing, organic chemical manufacturing, and fertilizer manufacturing. The subsector includes industry activity in the production of ethanol and other biofuels.

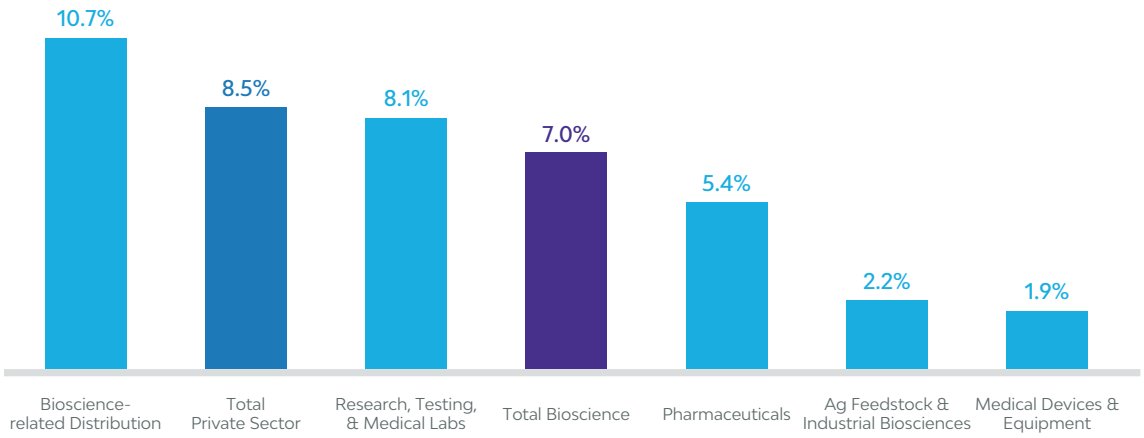
Bioscience-related distribution—Firms that coordinate the delivery of bioscience-related products spanning pharmaceuticals, medical devices, and ag biotech. Distribution in the bioscience industry is unique in its deployment of specialized technologies including cold storage, highly regulated monitoring and tracking, and automated drug distribution systems.

Medical devices and equipment—Firms that develop and manufacture surgical and medical instruments and supplies, laboratory equipment, electromedical apparatus including MRI and ultrasound equipment, dental equipment and supplies, and ophthalmic goods.

Pharmaceuticals—Firms that develop and produce biological and medicinal products and manufacture pharmaceuticals and diagnostic substances.

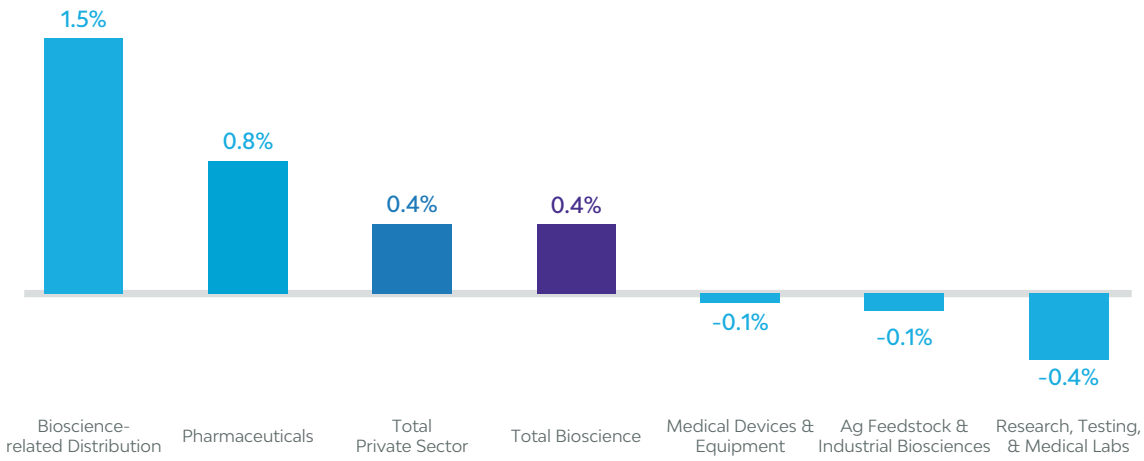
Research, testing, and medical laboratories—Firms engaged in research and development in biotechnology and other life sciences, life science testing laboratories, and medical laboratories. Includes contract and clinical R&D organizations.

Figure 6. Employment Growth Trends, Bioscience Industry and Major Subsectors, 2021-2025



Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Figure 7. Employment Growth Trends, Bioscience Industry and Major Subsectors, 2024-2025



Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Research, testing, and medical labs remains the nation's largest bioscience subsector, employing more than 779,000 in 2025—approximately one-third of all U.S. bioscience employment (Table 1). The subsector experienced significant growth in the first part of the 2021–25 period, increasing employment by 8.1 percent during this overall period and growing its establishment base by 37 percent, the fastest establishment growth among the five bioscience subsectors. This growth reflected the broad scale-up of commercial life sciences research and development, testing, laboratory services, and related activities in the post-pandemic period.

The more recent trend, however, illustrates the industrywide shift toward more cautious hiring. Employment peaked at nearly 789,000 in 2023, then declined by 0.9 percent in 2024 and by another 0.4 percent in 2025. The subsector's 2025 employment level remained above its 2021 base, but the latest two-year decline represents a significant departure from the exceptionally strong expansion recorded in 2022.

The commercial biotech and life sciences R&D components of the industry have contributed net job gains since 2021 despite modest job declines in 2024 and 2025. These gains were partly offset by modest declines in medical lab employment.

Bioscience-related distribution employed nearly 668,000 workers in 2025 following double-digit job and establishment gains since 2021. Employment has grown by 10.7 percent overall during this period, and unlike the other subsectors, distribution continued to add jobs each year, averaging 1.7 percent annual growth since 2022. The subsector's nearly 69,000 establishments represent the largest physical footprint among the bioscience subsectors. This ongoing expansion highlights the essential role of specialized distribution in moving pharmaceuticals, medical products and equipment, and agricultural bioscience products through complex and highly regulated supply chains.

The subsector's double-digit employment gain was driven primarily by medical, dental, and hospital equipment wholesalers, which added nearly 49,500 jobs from 2021 through 2025. Drug wholesalers also increased employment by more than 14,000 jobs.

Medical device and equipment manufacturers employed more than 430,000 in 2025, representing nearly one in five U.S. bioscience jobs. The subsector increased employment by 1.9 percent from 2021 through 2025, a modest gain compared with the other subsectors. The subsector was among the earliest to level off following the post-pandemic hiring surge. Employment rose by 5.3 percent in 2022, then averaged a 1.1 percent decline from 2023 through 2025. The 2025 employment total remains above the 2021 base, but the sector has yet to regain its 2022 peak.

Employment gains in surgical and medical instrument manufacturing and surgical appliance and supplies production helped support the medical device subsector's modest net growth from 2021 through 2025. These gains were partly offset by employment declines in electromedical and electrotherapeutic apparatus manufacturing, analytical laboratory instrument manufacturing, and irradiation apparatus manufacturing, while ophthalmic goods manufacturing was essentially unchanged.[6]

Pharmaceutical manufacturing employed nearly 364,000 workers in 2025, or roughly 16 percent of total bioscience employment. The subsector increased employment by 5.4 percent overall from 2021 through 2025 and expanded its establishment base by 31 percent. Pharmaceuticals has added jobs in each of the last four years, though following the strong 3.7 percent growth in 2022, subsector growth has averaged just 0.6 percent in the three years since.

The subsector's positive employment trend is notable given the capital intensity, lengthy product-development cycles, and evolving market conditions facing drug and biologics producers. Pharmaceutical manufacturing is also closely connected to upstream commercial biotechnology and life sciences R&D activity captured within the research, testing, and medical laboratories subsector.

Pharmaceutical employment growth was led by biological product manufacturing, medicinal and botanical manufacturing, and pharmaceutical preparation manufacturing, each of which added jobs over the 2021–25 period. These gains more than offset a decline in in-vitro diagnostic substance manufacturing, which experienced a contraction following its elevated pandemic-era employment levels.

Agricultural feedstock and industrial biosciences is the smallest of the five major subsectors, employing approximately 71,300 workers in 2025 across 2,158 business establishments. Employment increased by 2.2 percent from 2021 through 2025, while establishments expanded by 10.7 percent. The sector's employment pattern has been largely flat over the recent period. After little change in 2022, employment increased 2.3 percent in 2023 before declining modestly in both 2024 and 2025.

6 This edition of the biennial report now includes ophthalmic goods manufacturing in the medical device and equipment subsector. For further information see the Methodology Appendix to this report.

The subsector encompasses a diverse mix of activities at the intersection of agricultural inputs, agricultural processing, chemicals, renewable fuels, and biobased industrial products, and its employment trends are therefore influenced by market dynamics that differ from those shaping biopharmaceuticals, research services, and medical technologies.

Employment gains in agricultural feedstock and industrial biosciences from 2021 through 2025 were led by strong growth in soybean and other oilseed processing, ethyl alcohol manufacturing, and nitrogenous fertilizer manufacturing. These gains were partly offset by declines in fertilizer mixing-only manufacturing and more modest declines in phosphatic fertilizer manufacturing, while pesticide and other agricultural chemical manufacturing was also slightly below its 2021 employment level.

Table 1. U.S. Bioscience Establishment and Employment Summary, 2025 and Recent Trends

Bioscience Industry & Major Subsectors	Establishments		Employment	
	Count, 2025	Change, 2021-2025	Count, 2025	Change, 2021-2025
Agricultural Feedstock & Industrial Biosciences	2,158	10.7%	71,331	2.2%
Bioscience-related Distribution	68,949	10.0%	667,651	10.7%
Medical Devices & Equipment	13,595	24.6%	430,363	1.9%
Pharmaceuticals	7,880	31.0%	363,904	5.4%
Research, Testing, & Medical Laboratories	63,881	37.0%	779,368	8.1%
Total Biosciences	**156,463**	**22.1%**	**2,312,617**	**7.0%**

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Bioscience Industry Wages Reflect High-Value Activities and Specialized Talent Deployment

The economic importance of the bioscience industry is reflected in the wage levels earned by its workforce. Employees in the biosciences earn substantially more, on average, than their counterparts in the overall private sector and in most other major traded and knowledge-intensive industries. In 2025, the average U.S. bioscience worker earned $145,188 annually—$66,325, or 84 percent, more than the private sector average of $78,863. This wage premium reflects both the high-value research, development, manufacturing, testing, and distribution activities undertaken by bioscience companies and the industry's intensive demand for skilled scientific, technical, engineering, production, quality, regulatory, and other specialized talent.

Each of the five bioscience subsectors paid average annual wages above the overall private sector average in 2025. Research, testing, and medical laboratories led the industry at $167,555, followed by pharmaceuticals at $146,506 and bioscience-related distribution at $144,792. The industry's wage levels are comparable to, or exceed, those in many other major advanced industries, including professional, scientific, and technical services and overall manufacturing, and trail only information and finance and insurance among the major sectors shown in Table 2.

Table 2. Average Annual Wages for the Bioscience Industry and Other Major U.S. Industries, 2025

Biosciences & Other Major U.S. Industries	Average Annual Wages, 2025
Information	$190,948
Research, Testing, & Medical Laboratories	**$167,555**
Finance and Insurance	$153,022
Pharmaceuticals	**$146,506**
Total Biosciences	**$145,188**
Bioscience-related Distribution	**$144,792**
Professional, Scientific, and Technical Services	$135,303
Medical Devices & Equipment	**$110,757**
Agricultural Feedstock & Industrial Biosciences	**$105,506**
Manufacturing	$89,577
Construction	$84,832
Real Estate and Rental and Leasing	$80,277
Total Private Sector	**$78,863**
Transportation and Warehousing	$68,822
Health Care and Social Assistance	$66,519
Retail Trade	$43,467

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Bioscience Industry Economic Impacts: A $3.2 Trillion Driver of U.S. Economic Activity

The bioscience industry's high wages and innovation-intensive activities generate economic benefits that extend well beyond its direct employment base. Through its substantial purchases from suppliers, investments in specialized facilities and equipment, and the household spending supported by its well-compensated workforce, the industry drives significant economic activity throughout the national economy.

More than 2.3 million bioscience industry workers are employed across all 50 states, the District of Columbia, and Puerto Rico. The industry's research, production, and distribution activities depend on a broad and often interdependent network of suppliers and service providers, including relationships among the bioscience sectors themselves. In turn, the industry supports demand for inputs ranging from utilities, commodity and specialized materials, and research and production equipment to real estate, legal, information technology, and other business services.

> The 2.31 million U.S. bioscience employees, and their associated economic output, generate and support more than 7.36 million additional jobs throughout the entire national economy as indirect and induced employment effects.

Economic impact analysis captures these direct industry activities, as well as the additional economic activity generated through supplier purchases and the personal spending of bioscience workers and supplier employees, measured across three types of impacts:

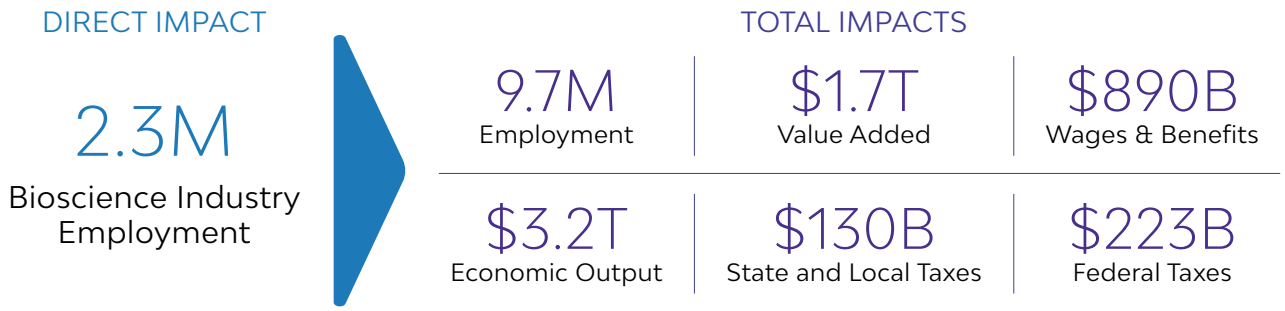
- **Direct impacts:** employment and other economic activity directly generated by the bioscience industry's operations and expenditures;
- **Indirect impacts:** economic activity generated by supplier firms to the bioscience industry; and
- **Induced impacts:** additional economic activity generated by the personal spending of the direct bioscience industry employees and the employees of the supplier firms in the overall economy.

The sum of these three is referred to as the total economic impact. TEConomy estimated the total economic impact of the U.S. bioscience industry in 2025 based on employment values for each detailed industry sector within the bioscience industry and evaluated the impacts across several key economic measures:

- **Employment.** The total number of full- and part-time jobs in all industries;
- **Personal Income.** The wages and salaries, including benefits, earned by the workers and proprietors holding the created and supported jobs;
- **Value-Added.** The difference between an industry's total output and the cost of its purchased inputs, value added includes personal income, taxes, and other property income (including profit). It is also considered to be the industry's contribution to gross state or gross domestic product (GSP or GDP); and
- **Output.** The total value of production or sales in all industries; a measure of total economic activity. The total output impacts are commonly referred to as the "economic impact" of an industry, project, or investment.
- **Tax Revenues.** An estimation of the tax revenues generated by industry activities at the local/county, state, and federal level—including corporate and personal income tax payments and both the employer and employee payments for social insurance taxes.

The 2.31 million U.S. bioscience employees, and their associated economic output, generate and support more than 7.36 million additional jobs throughout the entire national economy as indirect and induced employment effects (Figure 8 and Table 3). These additional jobs span numerous other industries ranging from those more unique to the bioscience industry—including purchased product inputs (e.g., chemicals, materials, components), real estate (e.g., owned and leased production and warehouse facilities), production machinery (e.g., precision metalworking equipment, bioreactors, packaging equipment) and research instruments (microscopes, gene sequencing equipment, mass spectrometers, and flow cytometers)—as well as significant expenditures on more traditional (though often highly specific in their own right) business services such as legal services, information technology, and utilities. The U.S. bioscience industry's employment multiplier is 4.18, which means that for every one bioscience job an additional 3.18 jobs are supported throughout the rest of the national economy.

Figure 8. Economic Impacts of the U.S. Bioscience Industry, 2025



Source: TEConomy data and analysis using IMPLAN Economic Impact Models (U.S. & PR).

Table 3. Economic Impacts of the U.S. Bioscience Industry, 2025 ($ in Billions)

		$ in Billions					
Impact Type	Employment	Labor Income	Value Added	Output	Local/County Tax Revenue	State Tax Revenue	Federal Tax Revenue
Direct Impacts	2,312,617	$332.4	$707.9	$1,443.6	$19.1	$28.9	$87.0
Indirect Impacts	3,198,170	$279.9	$462.7	$875.1	$13.6	$18.8	$67.4
Induced Impacts	4,163,000	$277.2	$519.2	$874.8	$22.3	$26.8	$69.0
Total Impacts	**9,673,787**	**$889.5**	**$1,689.8**	**$3,193.4**	**$55.0**	**$74.6**	**$223.3**
Multiplier	4.18	2.68	2.39	2.21			

Source: TEConomy data and analysis using IMPLAN Economic Impact Models (U.S. & PR).

A key economic indicator of the importance of the bioscience industry to the U.S. economy is estimated via the industry's value added. With the bioscience industry generating a direct value added of $707.9 billion and supporting a total value added of $1,689.8 billion in 2025, the industry accounted for 2.6 percent and 6.2 percent of U.S. private sector GDP, respectively.

Generating a direct value added of $707.9 billion and supporting a total value added of $1,689.8 billion in 2025, the U.S. bioscience industry accounted for 2.6 percent and 6.2 percent of U.S. private sector GDP, respectively.

The economic impact of the bioscience industry on the U.S. economy totaled $3.19 trillion dollars in 2025, as measured by overall output. This impact is generated by the estimated direct industry output of $1.44 trillion. This industry output when combined with the indirect and induced impacts support an industry output multiplier of 2.21. This means that for every $1 in U.S. bioscience industry output, an additional $1.21 in economic activity is generated throughout the rest of the national economy.

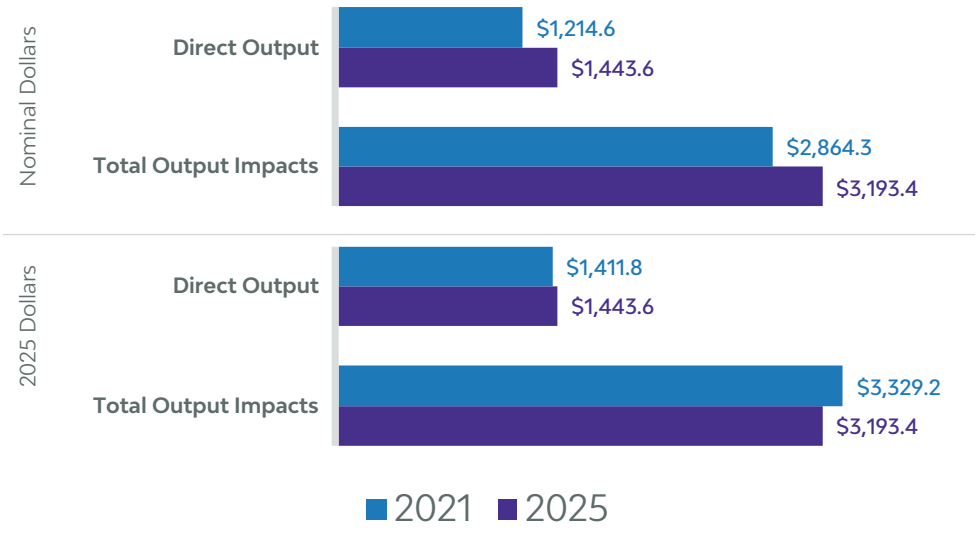
Finally, through the corporate, personal income, and other taxes paid by U.S. bioscience establishments (including both U.S.-based and non-U.S. headquartered firms), their suppliers, and their workers, the bioscience industry generates substantial tax revenue across the nation. These combined tax revenue impacts are estimated to have contributed $55 billion to local/county governments, $75 billion to state governments and $223 billion to the federal government in 2025.

Inflation Moderates the Real Growth in Bioscience Industry Economic Impacts

Total output represents the overall economic activity generated by the industry and its associated supply chain and household spending effects. While these impacts remain substantial, the comparison with 2021 demonstrates how recent inflation has affected the real value of this economic activity. In 2021, the U.S. bioscience industry generated $1.21 trillion in direct output and supported a total output impact of $2.86 trillion (Figure 9). By 2025, direct output had increased to $1.44 trillion and total output impacts reached $3.19 trillion.

In nominal terms, these figures represent gains of $229 billion in direct output and $329 billion in total economic output, respectively, from 2021 through 2025. After adjusting the 2021 figures for inflation, however, direct output increased only modestly—by approximately $32 billion in real terms—while total output impacts declined by 4 percent. This difference largely reflects the effects of inflation on the industry's supply chain purchases and on the purchasing power of wages and other labor income generated by the industry and its suppliers.

Figure 9: Economic (Output) Impacts of the U.S. Bioscience Industry, 2021 and 2025 ($B)



Source: TEConomy data and analysis using IMPLAN Economic Impact Models (US & PR). U.S. Bureau of Labor Statistics CPI Inflation Calculator.

Scaling U.S. Biomanufacturing: Investing in National and State Competitiveness

From Discovery to Commercial Production

Biomanufacturing is the process of using living cells, microorganisms, or other biological systems to produce biologically derived products at commercial scale. In the biopharmaceutical context and the special topic focus here, it includes the highly controlled production of vaccines, therapeutic proteins, monoclonal antibodies, blood and plasma-derived therapies, and other biologic medicines. Unlike conventional chemical production, the manufacturing process is closely tied to the characteristics, safety, and quality of the final product. This makes the transition from research discovery to validated, regulated production especially complex, capital-intensive, and dependent on specialized facilities, equipment, processes, and talent.[7]

Biomanufacturing is therefore a critical downstream component of the bioscience innovation ecosystem. The nation's ability to discover a new therapy does not by itself ensure that the therapy can be manufactured reliably, at commercial scale, and made available to patients. Bringing biologic products to market requires integrated capabilities in process development, cell-line development and cell banking, upstream and downstream processing, purification, analytical testing, quality assurance and control, regulatory compliance, fill-finish operations, and specialized distribution. The resulting manufacturing base is important not only to the growth of the bioscience industry, but also to health security, supply chain resilience, and national economic competitiveness.

A High-Growth U.S. Manufacturing Segment

Biological product manufacturing has been an important growth segment within the U.S. bioscience industry and the pharmaceuticals subsector.[8] In 2025, the industry employed 46,936 workers, an increase of 15.8 percent from 2021 (Figure 10). This growth rate was more than twice the gain for the total bioscience industry and nearly twice the growth rate of the overall private sector over the same period. The segment's expansion reflects growing demand for biologic medicines and therapies and hence, biologics portfolios, investment in advanced production systems, outsourcing demand for contract development and manufacturing organizations, and efforts to strengthen domestic and diversified production capacity.

Employment in biological product manufacturing is geographically broad, but it remains concentrated in a set of established and emerging production centers.

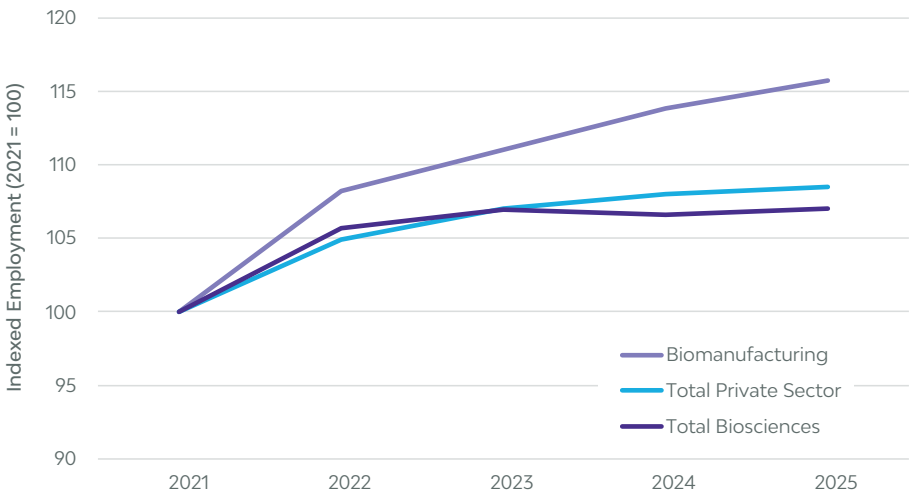
- Forty-five states had some employment in the industry in 2025, and 36 states had at least 50 jobs.
- At the same time, 77 percent of national employment was concentrated in 12 states.
- Twenty-six states increased employment from 2021 through 2025, 16 grew by more than 20 percent, and 16 had specialized employment concentrations relative to the national average.

Those states with 1,000 or more jobs in the sector are shown in Table 4.

7 Biotechnology Innovation Organization (BIO), "U.S. Biomanufacturing and Supply Chain: State Economic Development Public Policy and Partnerships," forthcoming, draft dated August 12, 2026.

8 For this assessment, biological product manufacturing is used as the most focused available industry measure or proxy of biopharmaceutical biomanufacturing. The measure corresponds to NAICS 325414, Biological Product (except Diagnostic) Manufacturing. It includes production activities associated with biological medicines but does not capture every activity commonly described as biomanufacturing. Certain cell and gene therapy, mRNA, viral-vector, fill-finish, contract manufacturing, and multiproduct operations may be classified differently depending on their primary activity. Likewise, industrial biotechnology, biofuels, agricultural biologicals, bioprocess equipment, consumables, and distribution are critical to the broader bioeconomy but are outside the focused scope of this section.

Figure 10. Indexed U.S. Employment in Biomanufacturing, the Bioscience Industry, and the Private Sector, 2021-2025 (2021 = 100)



Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 4. Biomanufacturing Employment, Recent Growth, and Relative Concentration (Location Quotient) by State, 2025

States with 1,000+ jobs	Employment	% Growth, 2021-2025	LQ, 2025
North Carolina	6,816	29.2%	4.61
New York	6,252	10.8%	2.13
Pennsylvania	4,398	21.0%	2.33
California	3,087	1.3%	0.57
Wisconsin	2,782	6.9%	3.10
Iowa	2,728	11.9%	5.95
Missouri	1,914	15.0%	2.20
Washington	1,823	28.7%	1.73
Maryland	1,715	-16.2%	2.19
Illinois	1,601	40.0%	0.87
Nebraska	1,425	34.5%	4.76
Massachusetts	1,419	-1.0%	1.27
New Hampshire	1,266	42.5%	5.97
Kansas	1,147	50.0%	2.76
Texas	1,024	-27.1%	0.24

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Major Capital-Intensive Investment Is Broadening U.S. Biomanufacturing Capacity

Biomanufacturing facilities are among the most complex and capital-intensive industrial investments. A new facility can require years of planning, construction, commissioning, process validation, and regulatory preparation before commercial production begins. Facilities need specialized cleanrooms, bioreactors, purification systems, analytical laboratories, digital quality systems, validated utilities, reliable high-quality water, advanced HVAC and environmental controls, wastewater capacity, and cold-chain logistics. As a result, biomanufacturing investment depends on much more than a traditional industrial site or general manufacturing incentive.

> "Over the past twelve months alone, U.S.-based and international pharmaceutical companies have announced significant increases in commitments to add biomanufacturing facilities that total hundreds of billions of dollars and over 17 million square feet of technologically-advanced facilities and a projected 30,000 jobs over the next 5 to 7 years."
>
> —BIO, forthcoming U.S. Biomanufacturing and Supply Chain: State Economic Development Public Policy and Partnerships

Recent company announcements show continued investment in biologics and related biopharmaceutical production across a diverse set of states.[9] Just a few of the many national examples[10] include:

- Amgen announced an additional $300 million investment in May 2026 to expand its biologics manufacturing facility in Juncos, Puerto Rico, strengthening U.S.-based production capacity and integrating advanced manufacturing technologies. The investment builds on a $650 million commitment announced in 2025 and is expected to support workforce development and hundreds of construction jobs.
- AstraZeneca's planned expansion of its Frederick, Maryland, biologics manufacturing facility will nearly double commercial production capacity and extend manufacturing to its rare-disease portfolio. Announced in November 2025 as part of a $2 billion Maryland manufacturing investment, the Frederick expansion is expected to create 200 highly skilled jobs and become operational in 2029.
- FUJIFILM Diosynth Biotechnologies' $2 billion large-scale cell-culture manufacturing site in Holly Springs, North Carolina, which was announced with 725 projected jobs.
- Merck Animal Health's $895 million Kansas investment to expand vaccine and large-molecule biologics manufacturing capacity; and Elanco's Kansas expansion, which increased monoclonal-antibody capacity by more than fourfold.
- Other recent facility or capacity announcements span Pennsylvania, Massachusetts, New Hampshire, Texas, New Jersey, Delaware, Indiana, and other states.

9 Biotechnology Innovation Organization (BIO), "U.S. Biomanufacturing and Supply Chain: State Economic Development Public Policy and Partnerships," forthcoming, draft dated August 12, 2026.

10 Announcements should be interpreted carefully: companywide investment commitments may include multiple facilities and functions, project schedules can change, and announced investments do not necessarily translate immediately into operating capacity or realized employment.

States Compete on Ecosystems, Not Incentives Alone

States and regions seeking to attract biomanufacturing investment must offer a combination of capital support, site readiness, specialized infrastructure, workforce preparation, and strong connections among companies, universities, training institutions, and economic development organizations.[11] General manufacturing incentives remain relevant, but they are most effective when paired with sector-specific capabilities that reduce the cost, timeline, and risk of constructing and operating a regulated biological-products facility. Key state and regional strategies and initiatives, and some examples include:[12]

- **Workforce development and customized training.** Biomanufacturing requires technicians, engineers, quality-control and quality-assurance professionals, validation specialists, automation and digital manufacturing talent, regulatory staff, and scientific personnel. North Carolina offers a long-standing integrated model that combines community college training, the BioWork certificate, BioNetwork, North Carolina State University's Biomanufacturing Training and Education Center, university programs, and customized industry training. Indiana's Heartland BioWorks is similarly building operator and technician pathways while linking training to scale-up, demonstration, and commercialization support. Ohio is similarly strengthening its biomanufacturing talent pipeline through a JobsOhio commitment of up to $30 million to establish and scale a workforce initiative anchored by the Ohio Life Science Training Center in New Albany, where industry-aligned training in simulated cleanrooms and laboratories will prepare workers for biopharmaceutical manufacturing roles.

- **Scale-up and demonstration infrastructure.** Early-stage and emerging companies often lack the capital, operational systems, or regulatory experience required to operate commercial production facilities. Shared scale-up infrastructure, pilot and demonstration capacity, and access to domestic contract development and manufacturing organizations can help close the gap between lab discovery and commercial production. Heartland BioWorks received an approximately $51 million federal implementation award to advance training, scale-up support, demonstration capacity, and commercialization infrastructure in Indiana. Delaware's continuing capital support for the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL) illustrates the role of sustained institutional investment in a national biopharmaceutical manufacturing network.

- **Performance-based capital incentives.** States continue to use grants, tax credits, sales-tax exemptions, workforce support, infrastructure assistance, and property-tax incentives to help offset the high fixed costs of facility development and expansion. North Carolina approved a Job Development Investment Grant valued at nearly $15 million for FUJIFILM's 2024 Holly Springs expansion, alongside approximately $3 million in workforce support. Pennsylvania committed $21 million to support GSK's Marietta expansion.

- **Site, utility, and logistics readiness.** Reliable power, high-quality water, wastewater-treatment capacity, specialized HVAC systems, controlled production environments, and access to temperature-controlled logistics are core requirements. Regions also need timely permitting, specialized construction and commissioning expertise, and locations capable of supporting both current operations and future expansion.

- **Cluster coordination and partnerships.** Robust biomanufacturing ecosystems require organizations that can connect companies with colleges, universities, utilities, real estate and site-development partners, regulators, suppliers, and public agencies. State and regional models vary, but organizations such as the North Carolina Biotechnology Center, BioCrossroads in Indiana, Ohio Life Sciences, NIIMBL in Delaware, and other industry-led and university-linked networks illustrate the value of coordinated sector support.

11 Biotechnology Innovation Organization (BIO), "U.S. Biomanufacturing and Supply Chain: State Economic Development Public Policy and Partnerships," forthcoming, draft dated August 12, 2026.

12 Ibid

The Bioscience Industry in U.S. States and Metropolitan Areas: Key Findings and Highlights

The nation's bioscience industry has a broad and diverse geographic footprint, with employment in every state, the District of Columbia, and Puerto Rico. While major industry hubs account for large shares of national employment, the industry's five subsectors support distinct state and regional specializations spanning research and testing, biopharmaceutical manufacturing, medical devices, agricultural and industrial biosciences, and the specialized distribution of bioscience products.

Highlights of State Industry Performance

Thirty-two states and Puerto Rico have a specialized employment concentration in at least one of the five bioscience subsectors in 2025 (Table 5). A specialized concentration is defined as a location quotient (LQ) of 1.20 or greater—meaning that the subsector represents a significantly larger share of a state's employment base than it does nationally. State specialization is widespread across the five subsectors.

- Seventeen states are specialized in agricultural feedstock and industrial biosciences; 11 states and Puerto Rico are specialized in pharmaceuticals; 12 states and Puerto Rico are specialized in medical devices and equipment; eight states and Puerto Rico are specialized in research, testing, and medical laboratories; and 10 states and Puerto Rico are specialized in bioscience-related distribution.
- Eight states and Puerto Rico exhibit especially diverse bioscience industry strengths, with specialized employment concentrations in three or more of the five major subsectors. Illinois, Indiana, Minnesota, Nebraska, New Jersey, North Carolina, Puerto Rico, South Dakota, and Utah each have specialized concentrations in at least three subsectors. Among these two have specializations in four subsectors—North Carolina and Puerto Rico.

Measuring Industry Concentration and State/Regional Specialization

Employment concentration is a useful and valuable way in which to gauge the relative importance of an industry to a state or regional economy.

State location quotients (LQs) measure the degree of job concentration within the state relative to the national average. States or regions with an LQ greater than 1.0 are said to have a concentration in the sector. When the LQ is significantly above average, 1.20 or greater, the state is said to have a "specialization" in the industry.

Despite the recent plateau in national employment, net job growth was broadly distributed across the states during the full 2021 through 2025 period (see Table 5 and the map in Figure 12).

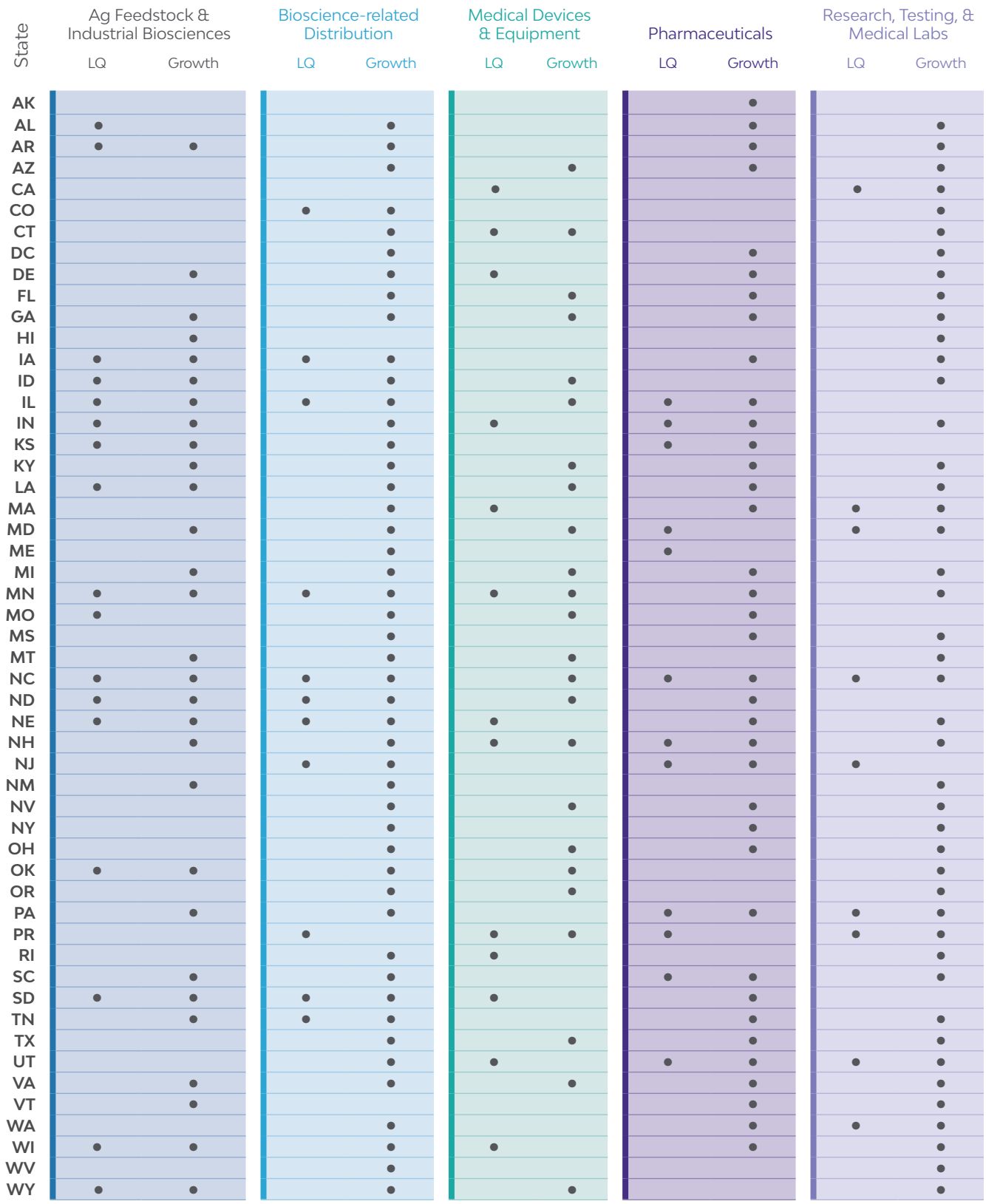
- Forty-one states, the District of Columbia, and Puerto Rico experienced net bioscience employment growth over the period.
- The leading states by absolute job gains were Texas, Florida, Massachusetts, Illinois, North Carolina, Pennsylvania, New York, Ohio, and New Jersey.

Diverse & Varied Strengths: Eight States and Puerto Rico have a Specialized Employment Concentration in Three or More Bioscience Industry Subsectors

Illinois, Indiana, Minnesota, Nebraska, New Jersey, North Carolina, Puerto Rico, South Dakota, and Utah

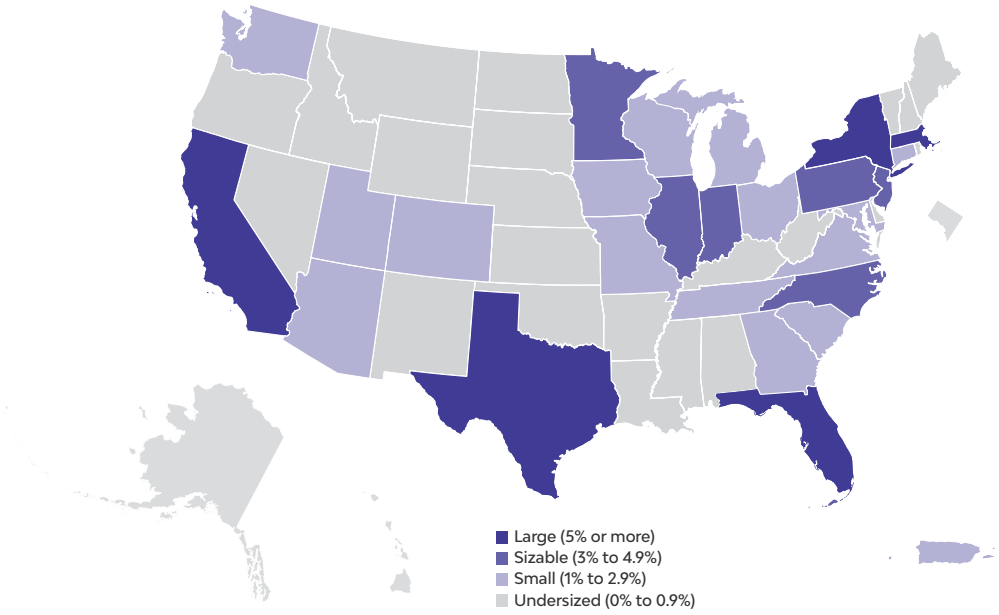
The leading states vary substantially by bioscience market and function. California has the nation's largest employment base in research, testing, and medical laboratories and in medical devices and equipment; New Jersey, North Carolina, Illinois, Indiana, and Pennsylvania are major centers for pharmaceutical manufacturing; Illinois, Iowa, and Indiana combine large employment bases with specialized concentrations in agricultural feedstock and industrial biosciences; and North Carolina, New Jersey, Tennessee, Minnesota, Colorado, Illinois, Nebraska, Iowa, North Dakota, and South Dakota have specialized bioscience-related distribution employment concentrations.

Table 5. State Specializations and Job Growth by Bioscience Subsector, 2021-2025



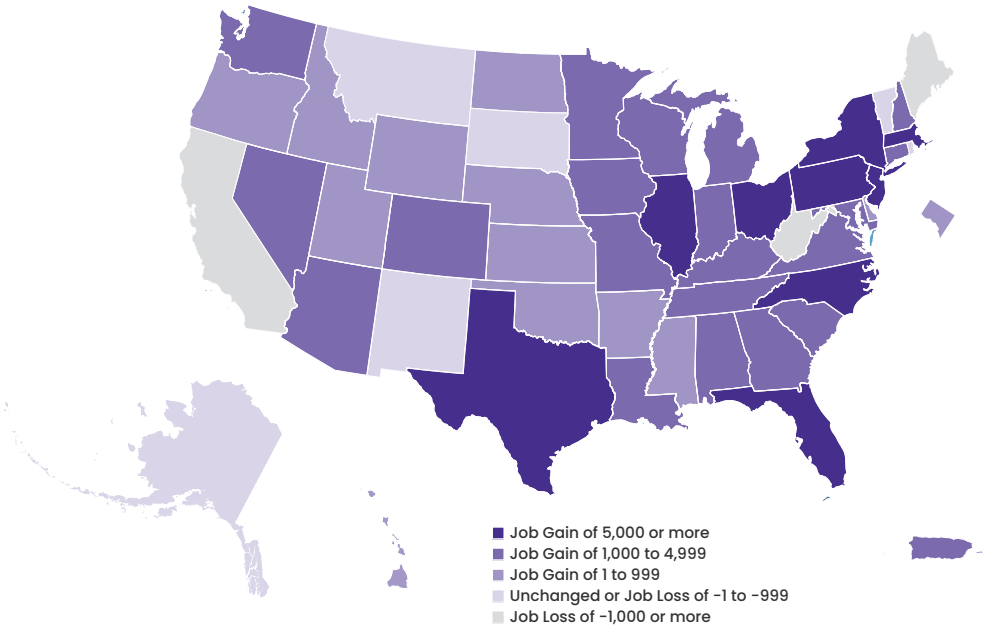
Note: Dots represent either a "specialized" employment concentration (LQ ≥ 1.20) or employment growth (> 0%).
Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Figure 11. Share of National Bioscience Industry Employment by State, 2025



Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Figure 12. Change in Bioscience Industry Employment by State, 2021-2025



Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Highlights of Metropolitan Area Industry Performance

More than half of U.S. metropolitan areas have a specialized employment concentration in at least one bioscience industry subsector or market. Of the nation's 387 metropolitan areas with bioscience industry employment, 206—or 53 percent—can claim this distinction, further evidence of the industry's broad geographic reach and the diversity of regional bioscience capabilities.

23 Metro Areas Exhibit Diverse Strengths in the Biosciences Spanning All U.S. Regions

Twenty-three metropolitan areas have an especially diverse set of bioscience industry strengths, with specialized employment concentrations in at least three of the five industry subsectors. These metros span all regions of the U.S. and all regional size categories, reflecting the broad distribution of bioscience industry capabilities nationally.

These include, with the number of subsector specializations in parentheses:

- Ames, IA (3)
- Bloomington, IN (3)
- Boston–Cambridge–Newton, MA–NH (3)
- Boulder, CO (4)
- Chicago–Naperville–Elgin, IL–IN (3)
- Durham–Chapel Hill, NC (4)
- Fargo, ND–MN (3)
- Fort Collins–Loveland, CO (3)
- Lebanon, PA (3)
- Logan, UT–ID (3)
- Madison, WI (4)
- Memphis, TN–MS–AR (3)
- Norwich–New London–Willimantic, CT (3)
- Raleigh–Cary, NC (3)
- Rocky Mount, NC (3)
- Salt Lake City–Murray, UT (4)
- San Diego–Chula Vista–Carlsbad, CA (3)
- San Francisco–Oakland–Fremont, CA (3)
- Santa Maria–Santa Barbara, CA (4)
- St. Joseph, MO–KS (3)
- Stockton–Lodi, CA (3)
- Trenton–Princeton, NJ (3)
- Worcester, MA (3)

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

The Innovation Ecosystem for the Biosciences: National Highlights and Leading States

The U.S. bioscience industry is supported by a broad innovation ecosystem that advances scientific discovery, technology development, company formation, and the translation of new ideas into products and services. This ecosystem extends from university and medical-center research through federal research support, clinical development, intellectual-property creation, and the capital required to advance promising technologies through commercialization.

For the biosciences, these interconnected assets are particularly important. Developing new therapeutics, diagnostics, medical technologies, agricultural innovations, and biobased products is resource-intensive, technically complex, and often requires long time horizons before commercial success is achieved. Sustained investment in research, strong institutions and collaborative networks, effective protection of intellectual property, and access to risk capital are therefore essential to maintaining U.S. leadership in a highly competitive global environment.

This section assesses national trends and highlights leading states across key measures of bioscience innovation capacity and activity:

- University bioscience research and development expenditures
- National Institutes of Health (NIH) research funding
- Bioscience-related patent awards
- Venture capital (VC) and angel investments in bioscience companies

In addition to these four elements that are consistently included in the biennial reports, this edition includes a special assessment and callout on clinical trials activities across the U.S.

University Bioscience R&D Reaches a New High in 2024

Research universities, academic medical centers, and affiliated research institutes play a foundational role in the U.S. bioscience innovation ecosystem. They advance basic and applied research across health sciences, biological and biomedical sciences, agricultural sciences, biological and biomedical engineering, natural resources and conservation, and other life sciences fields. These activities generate new scientific knowledge while also supporting the workforce, research infrastructure, collaborative partnerships, and technology-development pipeline on which bioscience companies depend.

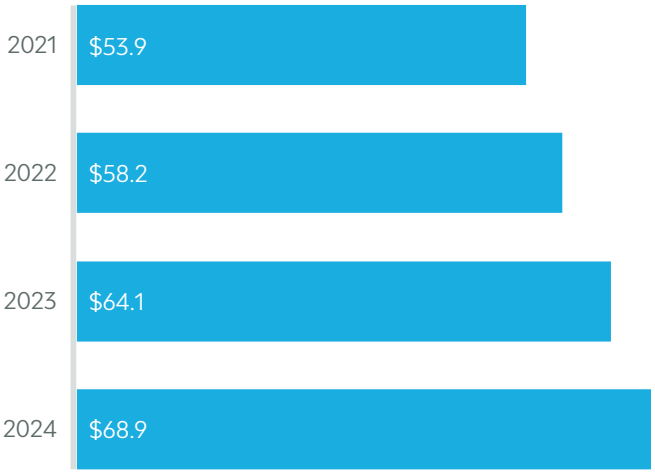
A foundation for future bioscience innovation

University bioscience R&D supports the scientific discoveries, specialized talent, facilities, and industry partnerships needed to advance new companies, technologies, and products.

Academic research institutions contribute at multiple points in the innovation process. University investigators and research centers frequently collaborate with established companies and emerging ventures; generate discoveries that can be licensed or spun out into new enterprises; and provide access to specialized facilities, clinical expertise, and scientific talent. Their research strengths can therefore help anchor and differentiate state and regional bioscience clusters.

In 2024, U.S. academic R&D expenditures in bioscience-related fields reached $68.9 billion (Figure 13). This represents a 28 percent increase from 2021, with expenditures growing by $15.0 billion over the three-year period. The annual pace of growth was especially strong in the latest year, with spending increasing 7.5 percent from 2023 to 2024, following a 10.1 percent increase from 2022 to 2023. Bioscience-related disciplines also remain the largest component of the nation's academic science and engineering research enterprise.

Figure 13. University Bioscience R&D Expenditures, FY 2021-2024 ($ in Billions)



Source: TEConomy analysis of National Science Foundation (NSF), National Center for Science and Engineering Statistics, Higher Education Research and Development (HERD) Survey.

The scale of academic bioscience R&D is concentrated in larger states with multiple major research universities and academic medical centers (Table 6). California led the nation with $9.32 billion in bioscience-related academic R&D expenditures in 2024, followed by New York at $6.43 billion, Texas at $5.56 billion, Pennsylvania at $4.17 billion, and North Carolina at $3.38 billion. Maryland, Massachusetts, Ohio, Illinois, and Michigan also each recorded more than $2 billion in academic bioscience R&D expenditures.

Growth in academic bioscience R&D was widespread from 2021 through 2024, though growth rates should be considered in the context of differences in each state's starting research base. Delaware and Maine recorded the fastest growth, increasing expenditures by 60 percent and 51 percent, respectively. South

Dakota, Wyoming, Alabama, Louisiana, Mississippi, Georgia, Florida, and New Jersey also increased their bioscience academic R&D expenditures by at least 35 percent over the period.

Several states stand out not only for the size of their research base but also for its intensity relative to population or the composition of their overall academic science and engineering R&D. The District of Columbia, Maryland, Connecticut, Massachusetts, New York, Pennsylvania, and North Carolina led the nation in bioscience academic R&D expenditures per capita in 2024. In Connecticut, Missouri, Kentucky, Minnesota, Oregon, Arkansas, North Carolina, Vermont, Nebraska, and Tennessee, bioscience-related disciplines accounted for particularly large shares of total academic science and engineering R&D activity. These measures highlight the outsized role that life sciences research plays within a number of state innovation systems.

Table 6. Leading States in Academic Bioscience R&D Expenditures and Growth

Academic Bioscience R&D Expenditures, 2024

Leading States	Total R&D Expenditures ($ Billions)
California	$9.32
New York	$6.43
Texas	$5.56
Pennsylvania	$4.17
North Carolina	$3.38
Maryland	$2.87
Massachusetts	$2.48
Ohio	$2.43
Illinois	$2.32
Michigan	$2.07

Academic Bioscience R&D Growth, 2021-2024

Leading States	Growth Rate, %
Delaware	59.7%
Maine	51.0%
South Dakota	45.6%
Wyoming	42.5%
Alabama	42.0%
Louisiana	40.9%
Mississippi	40.7%
Georgia	40.1%
Florida	38.0%
New Jersey	35.4%

Source: TEConomy analysis of National Science Foundation (NSF), National Center for Science and Engineering Statistics, Higher Education Research and Development (HERD) Survey.

Table 7. Leading States in Per Capita and Concentration of Academic Bioscience R&D Expenditures, 2024

Per Capita Expenditures

Leading States	$ Per Capita
District of Columbia	$721
Maryland	$460
Connecticut	$435
Massachusetts	$347
New York	$322
Pennsylvania	$319
North Carolina	$306
Vermont	$272
Wisconsin	$271
Missouri	$249

Share of Total Science & Engineering R&D

Leading States	% Share
Connecticut	82.2%
Missouri	81.5%
Kentucky	79.9%
Minnesota	77.3%
Oregon	76.5%
Arkansas	76.4%
North Carolina	75.8%
Vermont	75.4%
Nebraska	72.8%
Tennessee	72.5%

Source: TEConomy analysis of National Science Foundation (NSF), National Center for Science and Engineering Statistics, Higher Education Research and Development (HERD) Survey.

NIH Research Funding Declines Following Its 2023 Peak

Federal funding for biomedical research is critical to sustaining scientific discovery and advancing the bioscience innovation pipeline. Several federal agencies support life sciences research at U.S. universities, hospitals, research institutes, and companies, but the National Institutes of Health (NIH) is the nation's primary source of federal biomedical research funding. NIH awards help underpin basic and translational research, clinical research capacity, research infrastructure, and the early scientific advances that can lead to new therapeutics, diagnostics, devices, and other health innovations.

After several years of growth, NIH extramural research and related funding declined in the two most recent fiscal years. Total NIH awards reached $38.0 billion in FY 2023, then fell to $37.1 billion in FY 2024 and $36.7 billion in FY 2025.[13] The FY 2025 total was 3.4 percent below the FY 2023 peak but slightly above the $36.0 billion awarded in FY 2021. This recent moderation follows the stronger funding growth documented in prior editions of this report and represents an important signal for a bioscience ecosystem that depends upon sustained, long-horizon investment in biomedical discovery and development.

Figure 14. National Institutes of Health Awards, FY 2021-25 ($ in Billions)



Source: TEConomy analysis of National Institutes of Health RePORT data.

NIH funding remains concentrated in states with major academic medical centers, research universities, hospitals, and biomedical research institutes (Table 8). In FY 2025, California received $5.25 billion in NIH awards, followed by New York at $3.50 billion and Massachusetts at $3.41 billion. Pennsylvania and Maryland each received more than $2 billion, while Texas, North Carolina, Washington, Illinois, and Ohio each received at least $1 billion in NIH funding.

Several leading NIH recipient states also stand out for their intensity of funding relative to population. Massachusetts led the nation in NIH funding per capita at $477, followed by Maryland at $345 and the District of Columbia at $299. Connecticut, Rhode Island, New York, Pennsylvania, Washington, North Carolina, and Missouri also ranked among the leading states on this measure. These high concentrations reflect the important role of research-intensive universities, academic health systems, federal research institutions, and specialized biomedical research organizations in state and regional innovation ecosystems.

Funding trends varied substantially across states from FY 2021 through FY 2025. Idaho, South Dakota, Oklahoma, Arizona, New Hampshire, New Jersey, Kansas, Tennessee, and Connecticut all recorded growth rates exceeding the national trend over the period. Many of the fastest-growing states began from relatively modest funding bases, though growth in larger research states including Tennessee, Texas, Michigan, Missouri, Minnesota, and Pennsylvania points to strengthening biomedical research capacity in a broader set of regions. At the same time, several major NIH recipient states experienced declines over the period, including North Carolina, Washington, Maryland, and New York.

13 Funding totals for 2025 should be interpreted in light of a change in NIH grant accounting. In 2025, a larger share of awards was recorded as multiyear obligations funded up front rather than distributed incrementally across future years, therefore potentially overstating award and funding totals for 2025.

Table 8. Leading States in NIH Funding, FY 2025

Total NIH Funding		Per Capita NIH Funding		NIH Funding Growth, 2021-2025	
Leading States	Funding ($ Billions)	Leading States	$ Per Capita	Leading States	Growth Rate, %
California	$5.25	Massachusetts	$477	Idaho	63.2%
New York	$3.50	Maryland	$345	South Dakota	38.7%
Massachusetts	$3.41	District of Columbia	$299	Oklahoma	29.7%
Pennsylvania	$2.26	Connecticut	$224	Arizona	28.8%
Maryland	$2.16	Rhode Island	$216	New Hampshire	26.4%
Texas	$1.89	New York	$175	New Jersey	26.4%
North Carolina	$1.72	Pennsylvania	$173	Kansas	23.4%
Washington	$1.26	Washington	$158	Tennessee	22.3%
Illinois	$1.26	North Carolina	$153	Connecticut	19.0%
Ohio	$1.01	Missouri	$141	South Carolina	17.2%

Source: TEConomy analysis of National Institutes of Health RePORT data.

Clinical Trials:
A Critical Bridge from Bioscience Discovery to Patients

Clinical trials are an essential component of the bioscience innovation ecosystem and the pathway through which promising new therapies, diagnostics, devices, and other health innovations are evaluated for safety and effectiveness before reaching patients. The ability to design, sponsor, recruit for, and conduct clinical research requires a broad network of companies, research universities, academic medical centers, hospitals, physicians, investigators, and patients. This infrastructure has a wide geographic reach across the United States, linking bioscience innovation activity to communities in every state and most regions of the country.

For patients, clinical trials can provide access to emerging treatments and technologies, while for companies and research institutions they represent a critical stage in advancing scientific discoveries toward regulatory approval and commercial use. The scale, quality, and accessibility of this clinical research infrastructure are therefore important elements of both national bioscience competitiveness and regional innovation capacity.

Approach to Profiling Active Clinical Trials and their Scale, Sponsors, Phases, Types, and Geographic Footprint

ClinicalTrials.gov provides a consistent national data source for examining the scale, sponsorship, therapeutic focus, and geography of clinical research activity. Although the registry captures trials conducted both inside and outside the United States, this analysis focuses specifically on studies with at least one site in a U.S. state or Puerto Rico that were active at some point from 2021 through 2025. This includes trials that began, concluded, or remained ongoing during the five-year period, while excluding studies that were suspended, terminated, or withdrawn.

Using this approach, the analysis identifies 63,468 distinct clinical studies active in the United States or Puerto Rico during the 2021–25 period. Individual trials may operate at one location or across multiple sites, states, and countries; on average, the studies included in this analysis were available in 3.5 states. The results offer a national and state-level view of where clinical research activity is taking place, who is sponsoring it, and the types of studies and interventions being pursued.

Sponsors and Study Types

The U.S. clinical trials system is supported primarily by research institutions and industry. Universities, hospitals, institutes, and other research organizations sponsored 41,888 studies, or 66 percent of the active trials examined, while pharmaceutical, biotechnology, and medical device companies sponsored an additional 18,526 studies, or 29 percent. Together, these two

Leading Organizations Sponsoring U.S. Clinical Trials

Universities, Hospitals, Research Institutes

- Mayo Clinic
- M.D. Anderson Cancer Center
- Massachusetts General Hospital
- Stanford University
- University of Colorado, Denver
- Memorial Sloan Kettering Cancer Center

Industry

- AstraZeneca
- Pfizer
- Novartis Pharmaceuticals
- Eli Lilly and Company
- Merck Sharp & Dohme LLC

Research Networks/ Collaboration Groups

- Children's Oncology Group
- SWOG Cancer Research Network
- Radiation Therapy Oncology Group
- ECOG-ACRIN Cancer Research Group

sponsor groups accounted for 95 percent of all studies in the analysis, highlighting the complementary roles of academic and clinical research institutions and industry in advancing clinical innovation.

The remaining 5 percent of studies were sponsored by federal agencies, research networks and collaborative groups, or other government organizations. Among NIH-sponsored studies, the National Cancer Institute and National Institute of Allergy and Infectious Diseases together accounted for 68 percent of activity. Other federal clinical research activity was led by the U.S. Department of Veterans Affairs and its network of medical centers, which accounted for approximately 75 percent of studies sponsored by federal agencies other than NIH.

Most studies in the analysis—53,137, or 84 percent—were classified as interventional clinical trials. These studies assign participants to a specific intervention, such as a drug, device, procedure, biological product, or other treatment, in order to evaluate safety and effects. The remaining 10,331 studies, or 16 percent, were observational, collecting health information and monitoring outcomes without assigning a treatment or intervention.

Table 9. U.S. Clinical Trials by Funding Organization Type, and Type of Trial, Active in 2021-25

Funding Organization Type	Interventional	Observational	Total
Universities, Hospitals, Institutes, and Other Research Organizations	34,908	6,980	41,888
Industry (pharmaceutical, medical device, biotech)	15,737	2,789	18,526
Other Federal Agencies (VA, DoD, Other HHS, USDA)	1,184	146	1,330
National Institutes of Health (NIH)	908	300	1,208
Research Networks/Collaboration Groups	367	104	471
Other Government Organizations	33	12	45
Total	**53,137**	**10,331**	**63,468**

Source: TEConomy analysis of ClinicalTrials.gov data.

Clinical Development Activity

Among interventional trials, 25,569 specified a clinical trial phase (Table 10). Drug studies represented 21,183 of these trials, or 83 percent, reflecting the central role of therapeutic development in the nation's clinical research enterprise. Phase 2 trials were the most common single phase category, with 7,943 studies, followed by Phase 1 trials with 6,443 and Phase 3 trials with 4,247. An additional 2,482 trials were identified as combined Phase 1/Phase 2 studies and 626 as combined Phase 2/Phase 3 studies, demonstrating the substantial volume of research underway across the clinical development continuum.

The diverse range of potential therapy types further illustrates the breadth of the U.S. clinical research ecosystem. Drug-related studies were the most common, with 22,514 trials, followed by behavioral interventions with 13,228, other interventions with 13,012, devices with 9,830, procedures with 3,859, and biological interventions with 3,829. Trials may include more than one therapy type, particularly in studies evaluating complex or combination approaches, so these categories are not mutually exclusive.

Table 10. U.S. Interventional Clinical Trials by Phase, Active in 2021-25

Clinical Trial Phase	Number of Trials
Early Phase 1	1,324
Phase 1	6,443
Phase 1/Phase 2	2,482
Phase 2	7,943
Phase 2/Phase 3	626
Phase 3	4,247
Phase 4	2,504
Total	25,569

Source: TEConomy analysis of ClinicalTrials.gov data.

Table 11. U.S. Clinical Trials by Trial Type and Therapy Type, Active in 2021-25

Potential Therapy Type	Interventional	Observational	Total
Drug	21,668	846	22,514
Behavioral	12,679	549	13,228
Other	10,632	2,380	13,012
Device	8,099	1,731	9,830
Procedure	3,215	644	3,859
Biological	3,699	130	3,829
Diagnostic Test	846	1,001	1,847
Dietary Supplement	1,716	42	1,758
Radiation	1,190	85	1,275
Combination Product	515	43	558
Genetic	202	69	271
None		3,807	3,807

Source: TEConomy analysis of ClinicalTrials.gov data.

A Broad Geography

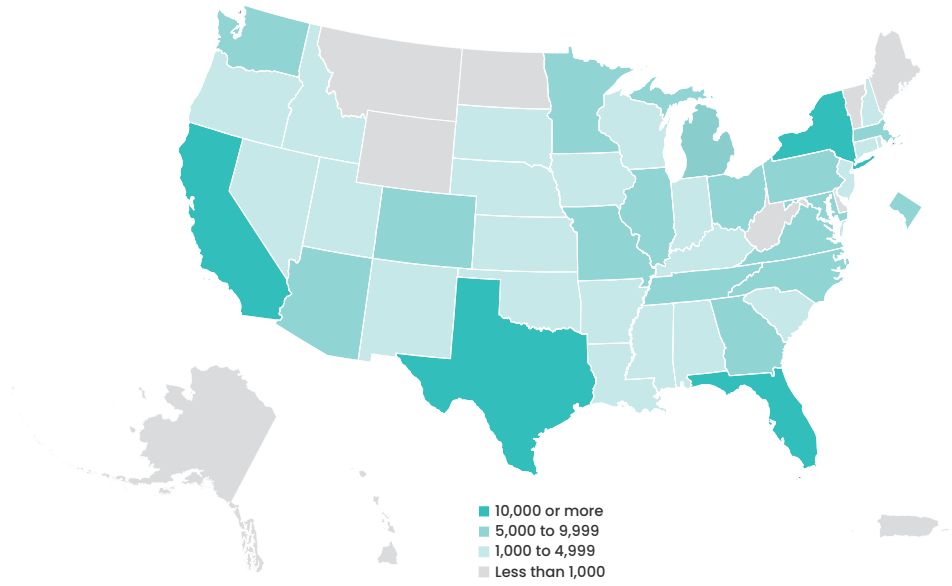
The geography of clinical trial activity demonstrates both a significant national asset and an ongoing challenge for the bioscience ecosystem. Clinical research sites operate across every state, the District of Columbia, and Puerto Rico, enabling participation by patients and institutions throughout the country. Large, diverse populations and major concentrations of research universities, academic medical centers, hospitals, and life sciences companies support particularly high volumes of activity in several states.

California led the nation with 16,738 clinical trials active during the 2021–25 period, followed by Texas with 13,742, New York with 12,695, and Florida with 11,686. Pennsylvania, Ohio, Massachusetts, North Carolina, Illinois, and Maryland also each participated in more than 6,500 active studies. These large states have the population scale and clinical infrastructure needed to support recruitment for large and complex trials, including later-stage studies that require substantial numbers and diversity of participants.

When normalized for population, smaller states and jurisdictions with concentrated research, healthcare, and industry assets stand out. The District of Columbia led with 3,371 active trials per 1 million residents, followed by Rhode Island with 1,310, Massachusetts with 1,243, Nebraska with 1,158, South Dakota with 1,074, Maryland with 1,049, Utah with 1,025, Kansas with 1,001, Minnesota with 984, and Connecticut with 978. Massachusetts and Maryland were the only states to rank among the national leaders on both total clinical trial activity and activity per capita, reflecting the scale and intensity of these states' academic medical, hospital, and bioscience industry base.

The broad distribution of clinical research activity is an important strength of the U.S. bioscience ecosystem. At the same time, access remains uneven across and within states, particularly for patients seeking trials associated with specific diseases, therapies, or trial phases. A strong national clinical research enterprise is most effective when the right studies are accessible to the patients and communities that need them, underscoring the importance of continued investment in clinical research capacity, diverse participant recruitment, and regional site networks.

Figure 15. U.S. Clinical Trials, Active in 2021-2025 Window, by State



Source: TEConomy analysis of ClinicalTrials.gov data

Table 12. Leading States in Bioscience-Related Clinical Trials, Active in 2021-2025

Number of Clinical Trials "Active In" 2021-2025

Leading States	Total Clinical Trials
California	16,738
Texas	13,742
New York	12,695
Florida	11,686
Pennsylvania	9,395
Ohio	9,066
Massachusetts	8,891
North Carolina	8,040
Illinois	7,717
Maryland	6,573

"Active In" Clinical Trials per 1M Population

Leading States	Clinical Trials per 1M Population
District of Columbia	3,371
Rhode Island	1,310
Massachusetts	1,243
Nebraska	1,158
South Dakota	1,074
Maryland	1,049
Utah	1,025
Kansas	1,001
Minnesota	984
Connecticut	978

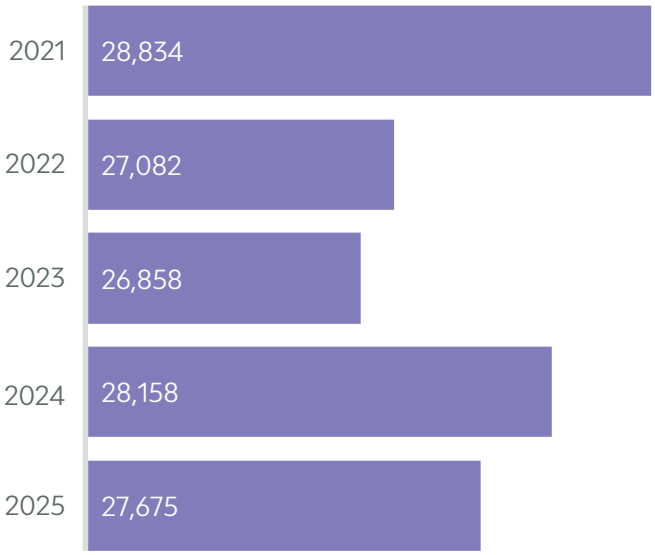
Source: TEConomy analysis of ClinicalTrials.gov data

Bioscience Patenting Reflects Breadth of U.S. Innovation and Diverse State Strengths

Patents provide an important indicator of innovation activity and the generation of intellectual property with potential commercial value. For bioscience companies and research institutions, robust and enforceable patent protections are particularly important because new therapeutics, diagnostics, medical technologies, agricultural innovations, and biobased products often require substantial research investment, extended development timelines, and rigorous regulatory review before reaching the market. Patent activity therefore offers one lens into the technology areas in which inventors and organizations are investing and seeking to protect new discoveries and applications.

Bioscience-related patent awards with at least one U.S.-based inventor continued to demonstrate the breadth of the nation's innovation base in 2025. Annual awards have varied over the latest five-year period, declining from 2021 through 2023 before increasing in 2024 and moderating in 2025 (Figure 16). While year-to-year variation in patent awards can reflect timing in the patent examination and issuance process as well as underlying innovation activity, the recent totals indicate that bioscience patenting remains active across a diverse range of scientific and technology domains.

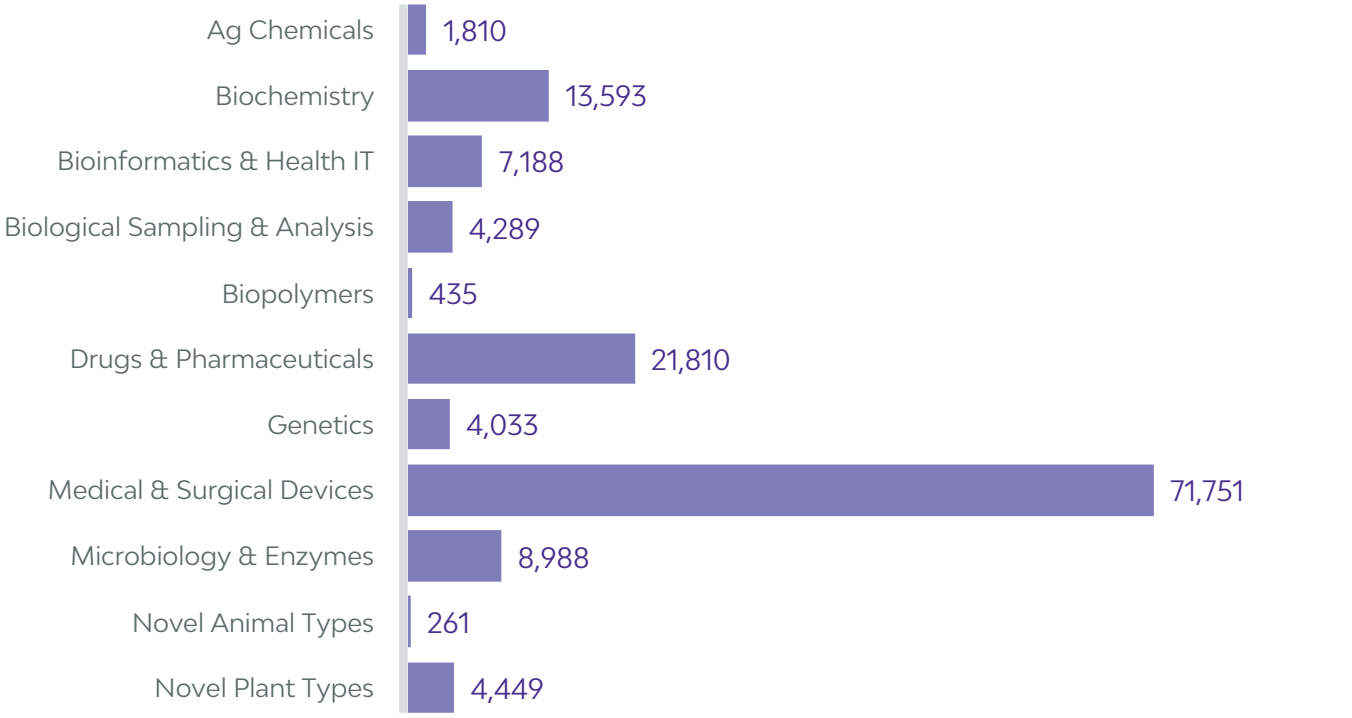
Figure 16. Bioscience-related U.S. Patents, 2021-25



Source: TEConomy analysis of U.S. Patent & Trademark Office data from the Clarivate Derwent Patent Search patent analysis database.

The breadth of this activity is evident in the distribution of patent awards across bioscience technology segments. Medical and surgical devices represent the largest segment of bioscience-related patenting, while drugs and pharmaceuticals and biochemistry are also major areas of innovation. Significant patenting activity is also found in microbiology and enzymes, bioinformatics and health IT, novel plant types, biological sampling and analysis, genetics, agricultural chemicals and fertilizers, biopolymers, and novel animal types. Together, these technology areas illustrate the wide-ranging scientific, clinical, agricultural, industrial, and digital applications advanced by the U.S. bioscience innovation ecosystem.

Figure 17. Bioscience-related U.S. Patents by Segment, Cumulative 2021-25



Source: TEConomy analysis of U.S. Patent & Trademark Office data from the Clarivate Derwent Patent Search patent analysis database.

Patent activity is concentrated in several of the nation's largest and most research-intensive bioscience hubs (Table 13). California led all states with nearly 43,000 bioscience-related patents during 2021–25, followed by Massachusetts with 18,865, New York with 9,620, Pennsylvania with 8,546, and New Jersey with 8,489. Minnesota, Florida, Texas, Ohio, and North Carolina also each generated more than 4,800 bioscience-related patents over the five-year period.

Several smaller states demonstrate especially intensive patenting activity relative to population. Massachusetts led the nation with 2,665 bioscience-related patents per 1 million residents over the 2021–25 period, followed by New Hampshire, Minnesota, Connecticut, California, Rhode Island, Delaware, New Jersey, the District of Columbia, and Maryland. These per-capita concentrations reflect the presence of specialized innovation assets and research-intensive institutions as well as industry strengths that vary across states.

Table 13. Leading States in Bioscience-Related Patents, Cumulative 2021-25

Patent Totals, 2021-2025

Leading States	Total Patents
California	42,682
Massachusetts	18,865
New York	9,620
Pennsylvania	8,546
New Jersey	8,489
Minnesota	7,985
Florida	7,782
Texas	7,062
Ohio	7,021
North Carolina	4,844

Patents Per 1M Population

Leading States	Patents per 1M Population
Massachusetts	2,665
New Hampshire	1,497
Minnesota	1,385
Connecticut	1,243
California	1,088
Rhode Island	929
Delaware	905
New Jersey	903
District of Columbia	766
Maryland	737

Source: TEConomy analysis of U.S. Patent & Trademark Office data from the Clarivate Derwent Patent Search patent analysis database.

The distribution of patent activity across specific technology areas further highlights the diverse and complementary capabilities found throughout the country (Table 14).

- California, Massachusetts, New York, New Jersey, and Pennsylvania stand out across multiple technology categories.
- Other states show focused strengths, including Minnesota in medical and surgical devices; Iowa in novel plant types; Missouri in genetics and agricultural technologies; and North Carolina in pharmaceuticals, genetics, and microbiology and enzymes.

These varied technology specializations demonstrate that bioscience innovation is not limited to a small set of leading hubs, but is supported by distinctive state and regional capabilities across the country.

Table 14. Leading States in Bioscience-related Patents by Class Group, Cumulative 2021-25

State	Total Biosciences	Ag Chemicals	Biochemistry	Bioinformatics & Health IT	Biological Sampling & Analysis	Biopolymers	Drugs & Pharmaceuticals	Genetics	Medical & Surgical Devices	Microbiology & Enzymes	Novel Animal Types	Novel Plant Types
AZ					○							
CA	●	●	●	●	●	●	●	●	●	●	●	●
CO				○					○			
CT			○		○						●	
FL	○	●	○	○		○	○		●		○	○
GA						○						
IA								○				●
IL				○								●
IN												○
MA	●	○	●	●	●	●	●	●	●	●	●	
MD			○		○		○	○		●		
MN	○	●							●		○	●
MO		●						●				○
NC	○	●				○	○	●		○		
NE												○
NJ	●	○	●	○	●	●	●		○	○	○	
NY	●	○	●	●	●	●	●	●	○	●	●	
OH	○				○	○	○		●			○
PA	●	○	●	●	○	●	●	○	○	○		
TX	○	○	○	●	●	○	○		○	●	●	
WA			○	○				○		○	○	
WI								○		○	○	●

Note: a shaded circle signifies the state ranks in the top 5 and an open circle signifies a ranking in the next 5 for that particular patent class group.
Source: TEConomy analysis of U.S. Patent & Trademark Office data from the Clarivate Derwent Patent Search patent analysis database.

Bioscience Venture Capital Investment Shows a Modest Rebound from Post-Pandemic Lows

Venture capital is a critical component of the bioscience innovation ecosystem. While not the only source of equity capital available to emerging companies, venture and angel investments are particularly important for bioscience firms seeking to advance research, generate preclinical and clinical evidence, scale technologies, build specialized teams and facilities, and navigate long development and regulatory pathways before achieving commercial revenues. The availability of risk capital therefore has important implications for the pace at which promising discoveries can be translated into new therapeutics, diagnostics, devices, digital health tools, agricultural technologies, and biobased products.

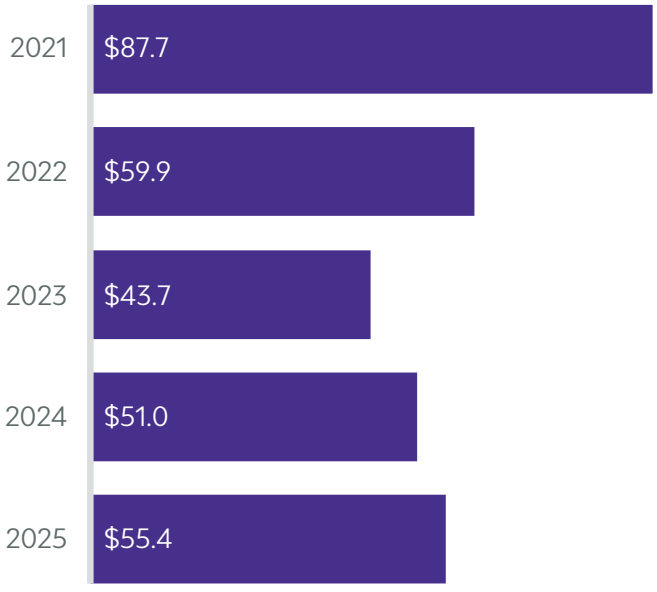
The latest data indicates a modest recovery in the bioscience VC market. Following 2023's recent low point, investment levels increased in 2024 and again in 2025, reaching $55.4 billion, though they remain well below the exceptional 2021 peak.

The U.S. bioscience industry experienced extraordinary venture investment activity during the pandemic and immediate post-pandemic period. Investments reached a record high in 2021 (Figure 18), reflecting heightened investor interest in biotechnology, vaccines, diagnostics, digital health, genomics, and other innovation areas. As documented in the prior edition of this report, the subsequent market correction was significant—bioscience-related VC investment declined sharply in 2022 and again in 2023 as higher interest rates, lower public-market valuations, and more constrained exit opportunities led investors and companies to adopt a more selective approach to financing and capital deployment.

The latest data indicate a modest recovery in the bioscience VC market. Following the 2023 low point, investment levels increased in 2024 and again in 2025, reaching $55.4 billion, though they remain well below the exceptional 2021 peak. This rebound is an encouraging signal for the sector, particularly given the capital-intensive and long-horizon nature of bioscience innovation.

Despite the rebound, intra-industry funding dynamics have caused concerns. BIO monitors and reports on funding conditions for the industry and its 2025 *State of Emerging Biotech Companies* investment report raised significant concerns that "early-stage funding for emerging biotechs has grown scarce," with Series A-1 investment in biopharma flat from 2023 to 2024 and weakening in 2025.[14] This is just one indication that the recovery in aggregate funding has not necessarily extended evenly to the earliest-stage companies.

Figure 18. Bioscience-related Venture Capital Investments, 2021-25 ($ in Billions)



Source: TEConomy analysis of PitchBook Data, Inc.

14 BIO, "The State of Emerging Biotech Companies: Investment, Deal, and Pipeline Trends," June 2025.

Across the full 2021 through 2025 period, U.S. bioscience companies received nearly $298 billion in venture and angel investments through almost 29,800 deal transactions involving nearly 15,500 companies (Table 15).

In general, later-stage investments tend to be significantly larger than those at the earliest stages of company development, though deal volumes tend to be higher for earlier-stage investments as investors fund smaller rounds often across several tranches. These dynamics have maintained during the 2021 through 2025 period, where pre-seed through early stage companies account for 76 percent of all VC deals, but just 41 percent of funding totals. In this context, later-stage venture investments accounted for by far the largest share of funding, 59 percent, totaling $176.7 billion. The average investment was $10.0 million per deal and $19.2 million per company across the full five-year period.

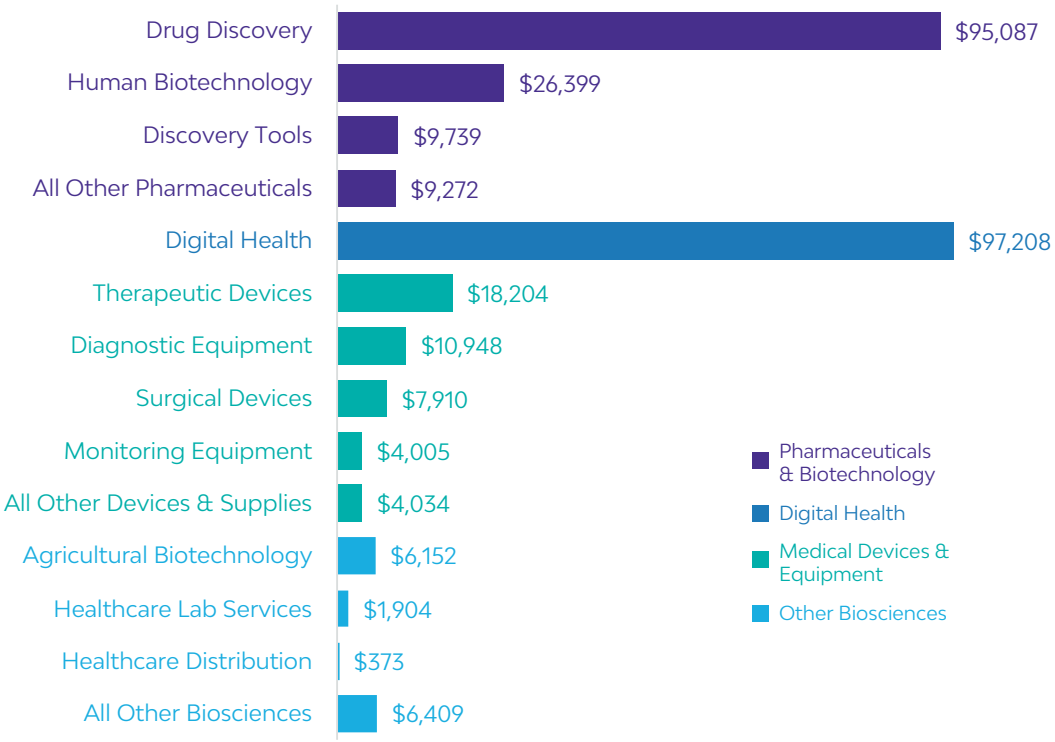
Table 15. U.S. Bioscience Venture Capital Investments by Stage, Cumulative 2021-25

Stage	Number of Deals	Number of Companies	Total VC Investments ($ Millions)	Average Investment per Deal ($ Millions)	Average Investment per Company ($ Millions)
Pre-Seed	10,792	6,832	$1,207	$0.11	$0.18
Angel	1,073	934	$885	$0.83	$0.95
Seed	5,699	4,558	$20,122	$3.53	$4.41
Early Stage VC	5,002	3,947	$98,714	$19.73	$25.01
Later Stage VC	7,194	4,730	$176,715	$24.56	$37.36
Total	29,760	15,497	$297,644	$10.00	$19.21

Source: TEConomy analysis of PitchBook Data, Inc.

The distribution of investment by market segment illustrates the breadth of venture-backed bioscience innovation. Biopharmaceutical development—including drug discovery, human biotechnology, and other pharmaceutical applications—remains a central focus of investor activity. Digital health also represents a major investment category, while medical devices and equipment, agricultural biotechnology, healthcare laboratory services, and bioscience-related distribution contribute to a more diverse portfolio of venture-backed innovation.

Figure 19. Bioscience-related Venture Capital Investments by Segment, Cumulative 2021-25 ($ in Millions)



Source: TEConomy analysis of PitchBook Data, Inc.

Investment activity remained concentrated in the industry's largest bioscience hubs. California companies received $109.9 billion in bioscience VC investment from 2021 through 2025, followed by Massachusetts at $61.8 billion and New York at $27.3 billion (Table 16). Together, California and Massachusetts accounted for well over one-half (58 percent) of national bioscience VC investment over the period. Texas, Colorado, Illinois, North Carolina, Washington, Pennsylvania, and Minnesota also ranked among the leading states for total investment. On a per-capita basis, Massachusetts led the nation, followed by California, Delaware, New York, Colorado, Connecticut, Minnesota, Washington, Maryland, and North Carolina.

Table 16. Leading States in Bioscience Venture Capital Investments, Cumulative 2021-25

Total VC Investments, 2021-25

Leading States	Total Investment ($ Millions)
California	$109,880
Massachusetts	$61,845
New York	$27,280
Texas	$11,137
Colorado	$7,504
Illinois	$6,514
North Carolina	$6,379
Washington	$6,281
Pennsylvania	$6,213
Minnesota	$5,917

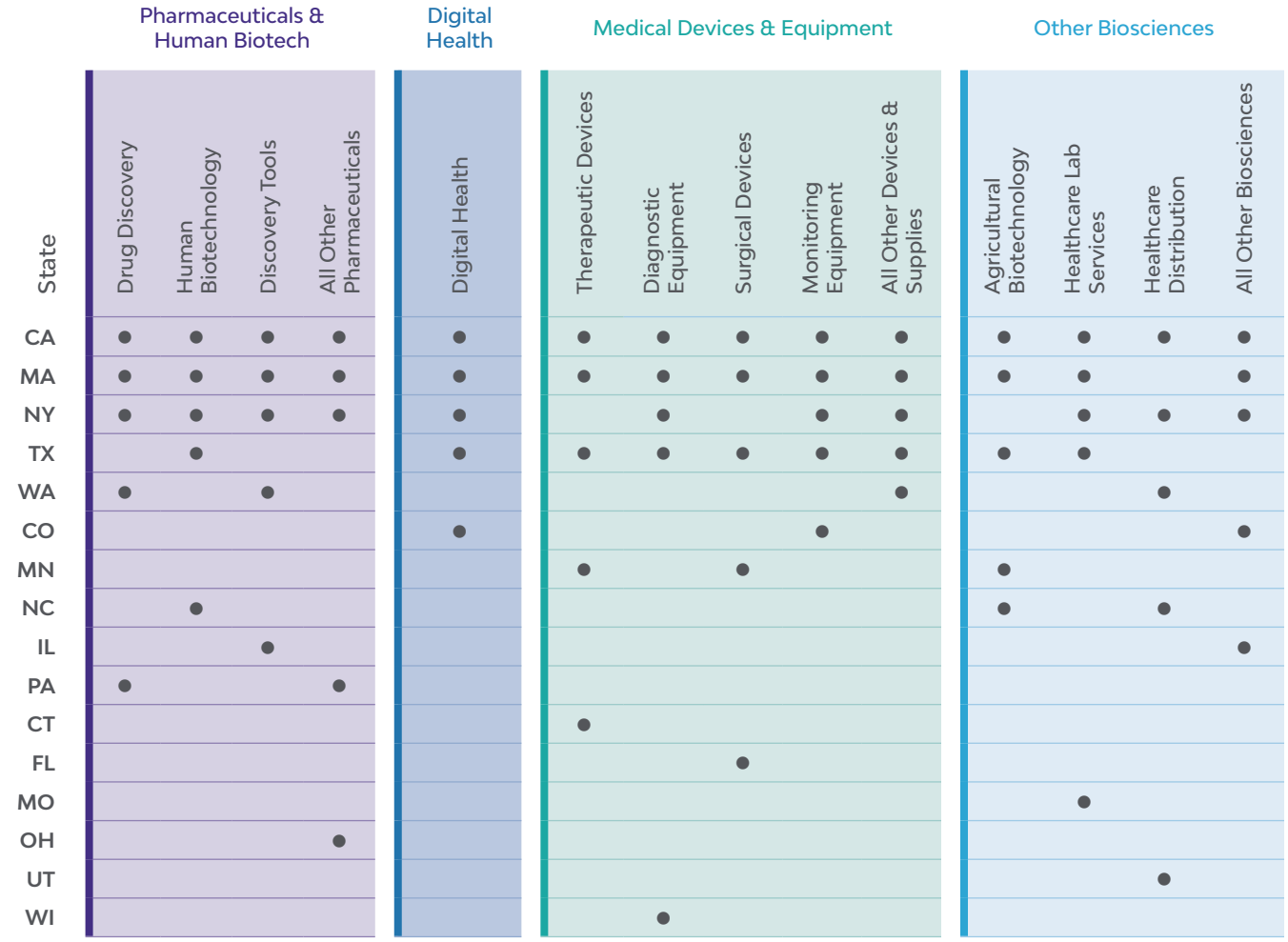
Per Capita VC Investments, 2021-25

Leading States	$ Per Capita
Massachusetts	$8,738
California	$2,800
Delaware	$2,020
New York	$1,373
Colorado	$1,268
Connecticut	$1,128
Minnesota	$1,026
Washington	$799
Maryland	$639
North Carolina	$586

Source: TEConomy analysis of PitchBook Data, Inc.

The state-by-segment analysis in Table 17 highlights the concentration of leading innovation capabilities in California, Massachusetts, New York, and other established hubs, while also demonstrating specialized strengths across a broader group of states.

Table 17. Leading States in Bioscience Venture Capital Investments by Segment, Cumulative 2021-25



Source: TEConomy analysis of PitchBook Data, Inc.

State and Metropolitan Area Performance Across the Bioscience Industry Subsectors

This section provides an in-depth examination of the employment position and recent performance trends for states across each of the five major bioscience industry subsectors.

Data were tabulated for each state, the District of Columbia, and Puerto Rico, and for every U.S. Metropolitan Statistical Area (MSA) to determine the size and relative employment concentration within each subsector. In addition, employment gains and declines were calculated to highlight recent trends.

The key metrics used in this section include:

- **Employment size** measuring the absolute level of jobs within each region.
    - To allow for meaningful comparisons, each region's share of total U.S. subsector employment was analyzed. States with more than 5 percent of national employment are designated "large"; states with more than 3 percent but less than 5 percent are referred to as "sizable."
    - For metropolitan regions, a table is included for each subsector presenting the top 25 metropolitan regions in total employment.
- **Employment concentration** is a useful way in which to gauge the concentration of a region's employment relative to the national average. While employment size reveals the largest geographic components, employment concentration can reveal the relative importance of the subsectors to a regional or state economy.
    - State and regional location quotients (LQs) measure the degree of job concentration within the region relative to the nation. States or regions with an LQ greater than 1.00 are said to have a concentration in the subsector. When the LQ is significantly above average, 1.20 or greater, the state is said to have a "specialization" in the subsector.
    - For metropolitan regions, a table is provided presenting the top 15 metropolitan areas according to LQs, based on the total employment size of the region (either small, medium, or large).
- The level of **employment growth or loss** over the 2021 to 2025 period provides a way in which to measure the performance of a state's bioscience industry. In this analysis, job growth or loss was measured by absolute employment gains or losses, as percentage changes may overstate trends in those states with a smaller subsector employment base.

Agricultural Feedstock & Industrial Biosciences

The agricultural feedstock and industrial biosciences subsector applies life sciences knowledge, biochemistry, and biotechnologies to the processing of agricultural goods, like crops, animals, and agricultural inputs, as well as organic and agricultural chemicals. The subsector also includes activities around the production of biofuels and feedstocks for biobased polymers.

Examples of Products

- Agricultural seeds improved using biotechnology
- Fertilizers, pesticides, herbicides, fungicides and agricultural microbials
- Corn and soybean oil
- Ethanol and industrial fermentation
- Organic chemicals made from renewable resources or through biological processes
- Polymers, plastics and textiles synthesized from plant-based feedstock or through biological processes
- Biobased ingredients for cosmetics, personal care products, flavors and fragrances

Examples of Companies

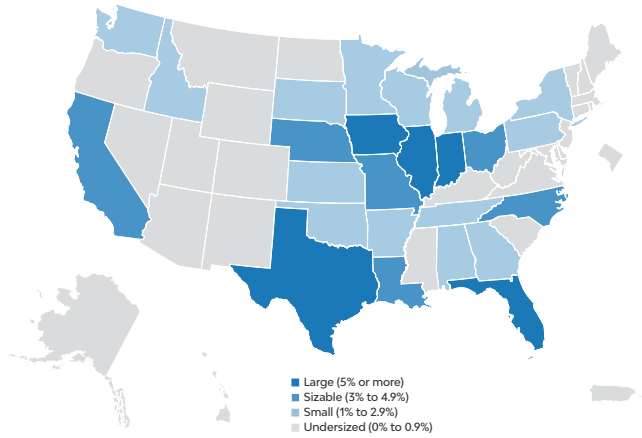
- Amyris
- Archer Daniels Midland
- BASF
- Bayer Crop Science
- Bunge
- Corteva Agriscience
- Novonesis
- Pivot Bio
- POET
- The J.R. Simplot Company

States that are Both Large and Specialized*

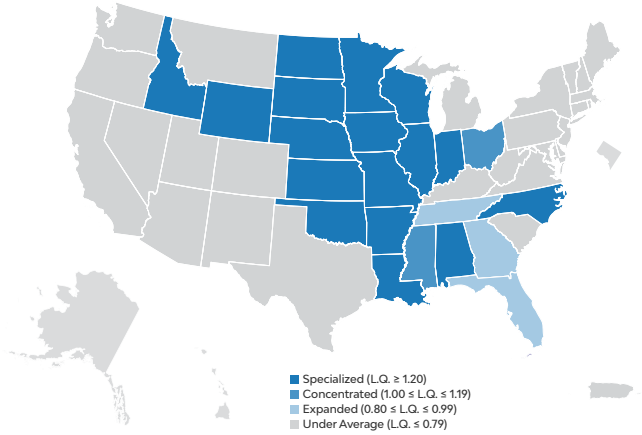
- Illinois
- Iowa
- Indiana

*States are listed in descending order by subsector employment levels.

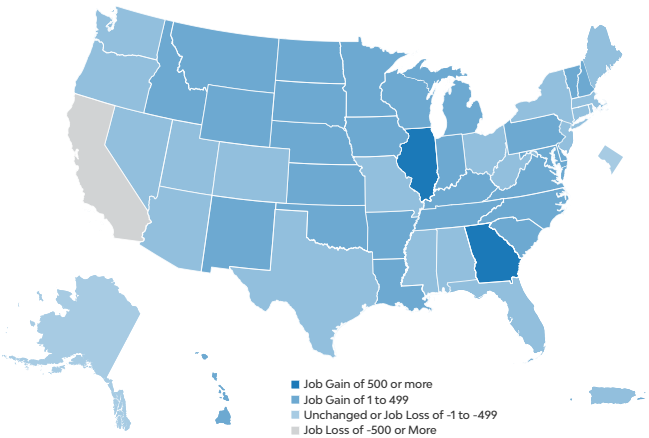
State Share of Total U.S. Employment, 2025



Employment Concentration Relative to the U.S., 2025



Employment Gains and Losses, 2021-2025



Agricultural Feedstock & Industrial Biosciences

State Leaders & Highlights

Employment Size: Employment is relatively concentrated in the top 11 states, which account for 68 percent of employment in this subsector. Those states are:

- **Large States:** Illinois, Iowa, Texas, Florida, Indiana
- **Sizable States:** California, Missouri, Nebraska, Louisiana, Ohio, North Carolina

Employment Concentration: Seventeen states have a specialized concentration of jobs in the agricultural feedstock and industrial biosciences subsector, more than for any other subsector. These concentrations are primarily in the Midwest and South.

- **Specialized States:** Iowa, Nebraska, South Dakota, Wyoming, North Dakota, Illinois, Louisiana, Idaho, Indiana, Missouri, Kansas, Oklahoma, Arkansas, Alabama, Wisconsin, Minnesota, North Carolina
- **Concentrated States:** Ohio, Mississippi

Employment Growth: Over the 2021 to 2025 time period, 29 states experienced some increase in subsector employment, led by Georgia, Illinois, Iowa, Pennsylvania, and North Carolina.

Large and Specialized States: Three states have both large employment shares and a specialized concentration of jobs in agricultural feedstock and industrial biosciences (Table 18).

Table 19. Metropolitan Statistical Areas with the Largest Employment Levels in Agricultural Feedstock and Industrial Biosciences, 2025

Metropolitan Statistical Area	2025 Employment
Decatur, IL	5,806
Chicago-Naperville-Elgin, IL-IN	2,654
Baton Rouge, LA	1,762
Houston-Pasadena-The Woodlands, TX	1,742
Lakeland-Winter Haven, FL	1,554
Lafayette-West Lafayette, IN	1,293
Omaha, NE-IA	1,030
Columbus, OH	975
New Orleans-Metairie, LA	937
Cedar Rapids, IA	933
Memphis, TN-MS-AR	846
Indianapolis-Carmel-Greenwood, IN	843
Madison, WI	805
Kansas City, MO-KS	793
Greensboro-High Point, NC	729
Tampa-St. Petersburg-Clearwater, FL	710
Des Moines-West Des Moines, IA	704
Sioux City, IA-NE-SD	609
New York-Newark-Jersey City, NY-NJ	575
Dallas-Fort Worth-Arlington, TX	562
St. Joseph, MO-KS	522
St. Louis, MO-IL	521
Peoria, IL	472
Fresno, CA	459
Beaumont-Port Arthur, TX	431

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 18. States with Large and Specialized Employment in Agricultural Feedstock and Industrial Biosciences, 2025

State	Establishments, 2025	Employment, 2025	Location Quotient, 2025	Share of U.S. Employment
Illinois	109	9,594	3.43	13.5%
Iowa	127	8,514	12.21	11.9%
Indiana	58	3,901	2.62	5.5%

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 20. Metropolitan Statistical Areas with the Highest Location Quotients in Agricultural Feedstock and Industrial Biosciences, by Size of MSA, 2025

Metropolitan Statistical Area	Location Quotient	2025 Employment
Large MSAs (Total Private Employment Greater than 250,000)		
Baton Rouge, LA	9.94	1,762
Madison, WI	4.71	805
New Orleans-Metairie, LA	4.53	937
Omaha, NE-IA	4.51	1,030
Greensboro-High Point, NC	4.27	729
Des Moines-West Des Moines, IA	3.76	704
Memphis, TN-MS-AR	3.01	846
Fresno, CA	2.18	459
Columbus, OH	1.95	975
Indianapolis-Carmel-Greenwood, IN	1.64	843
Kansas City, MO-KS	1.58	793
Knoxville, TN	1.39	272
Chicago-Naperville-Elgin, IL-IN	1.26	2,654
Tulsa, OK	1.22	261
Houston-Pasadena-The Woodlands, TX	1.15	1,742
Medium MSAs (Total Private Employment Between 75,000 and 250,000)		
Lafayette-West Lafayette, IN	29.92	1,293
Cedar Rapids, IA	14.43	933
Lakeland-Winter Haven, FL	12.40	1,554
Peoria, IL	6.14	472
Beaumont-Port Arthur, TX	5.84	431
Fayetteville, NC	4.82	238
Gainesville, GA	4.58	224
Lubbock, TX	4.58	316
Bellingham, WA	3.75	156
Fargo, ND-MN	3.40	234
Mobile, AL	2.90	229
Lancaster, PA	2.68	335
Kennewick-Richland, WA	2.60	163
Lincoln, NE	2.52	197
Sioux Falls, SD-MN	2.49	214
Small MSAs (Total Private Employment Less than 75,000)		
Decatur, IL	274.57	5,806
St. Joseph, MO-KS	21.06	522
Enid, OK	19.16	202
Sioux City, IA-NE-SD	17.40	609
Valdosta, GA	17.15	390
Mankato, MN	16.24	414
Gettysburg, PA	11.17	174
Hanford-Corcoran, CA	8.11	158
Cheyenne, WY	7.77	144
Owensboro, KY	5.77	134
Grand Island, NE	5.67	103
Rocky Mount, NC	5.24	123
Bloomington, IL	4.82	190
Sebring, FL	3.81	49
Sandusky, OH	3.75	86

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Pharmaceuticals

The pharmaceuticals subsector produces commercially available medicinal and diagnostic substances. The subsector is generally characterized by large multinational firms heavily engaged in R&D and manufacturing activities to bring drugs to market.

Examples of Products

- Biopharmaceuticals
- Vaccines
- Targeted disease therapeutics
- Tissue and cell culture media
- Dermatological/topical treatments
- Diagnostic substances
- Animal vaccines and therapeutics

Examples of Companies

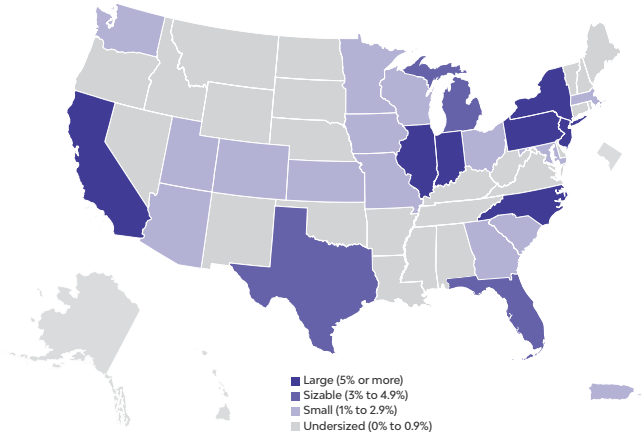
- Alkermes
- Alnylam Pharmaceuticals
- Amgen
- Bayer
- Biogen
- Eli Lilly and Company
- GlaxoSmithKline
- Johnson & Johnson
- Novo Nordisk
- Pfizer
- Roche Group-Genentech
- Vertex Pharmaceuticals

States that are Both Large and Specialized*

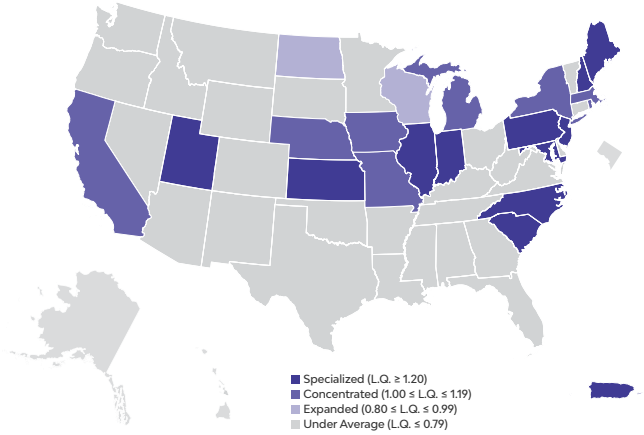
- New Jersey
- North Carolina
- Illinois
- Indiana
- Pennsylvania

*States are listed in descending order by subsector employment levels.

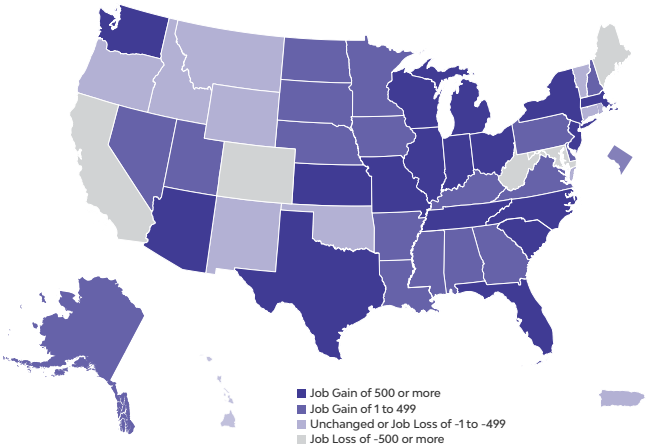
State Share of Total U.S. Employment, 2025



Employment Concentration Relative to the U.S., 2025



Employment Gains and Losses, 2021-2025



Pharmaceuticals

State Leaders & Highlights

Employment Size: Pharmaceutical manufacturing has a relatively high concentration among the leading states. The seven largest employer states in this subsector account for just over half of U.S. employment.

- **Large States:** California, New Jersey, North Carolina, New York, Illinois, Indiana, Pennsylvania
- **Sizable States:** Texas, Florida, Puerto Rico, Michigan

Employment Concentration: Eleven states and Puerto Rico have a specialized concentration of jobs in the pharmaceuticals subsector.

- **Specialized States:** Puerto Rico, Indiana, New Jersey, North Carolina, Utah, Maine, Illinois, Maryland, Kansas, Pennsylvania, New Hampshire, South Carolina
- **Concentrated States:** Massachusetts, Iowa, Nebraska, New York, Michigan, Rhode Island, California, Missouri

Employment Growth: Over the 2021 to 2025 time period, 36 states and DC experienced some increase in subsector employment, led by New Jersey, Florida, North Carolina, Indiana, and Illinois.

Large and Specialized States: Five states have both a large employment share and a specialized concentration of jobs in pharmaceuticals (Table 21).

Table 22. Metropolitan Statistical Areas with the Largest Employment Levels in Pharmaceuticals, 2025

Metropolitan Statistical Area	2025 Employment
New York-Newark-Jersey City, NY-NJ	39,297
Chicago-Naperville-Elgin, IL-IN	21,900
Indianapolis-Carmel-Greenwood, IN	17,266
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	16,645
San Francisco-Oakland-Fremont, CA	12,607
Los Angeles-Long Beach-Anaheim, CA	12,289
Boston-Cambridge-Newton, MA-NH	8,928
Washington-Arlington-Alexandria, DC-VA-MD-WV	8,310
San Diego-Chula Vista-Carlsbad, CA	8,034
Durham-Chapel Hill, NC	6,990
Miami-Fort Lauderdale-West Palm Beach, FL	6,212
Dallas-Fort Worth-Arlington, TX	5,966
Raleigh-Cary, NC	5,606
Albany-Schenectady-Troy, NY	5,128
Phoenix-Mesa-Chandler, AZ	4,852
Minneapolis-St. Paul-Bloomington, MN-WI	4,594
Houston-Pasadena-The Woodlands, TX	3,808
St. Louis, MO-IL	3,803
Tampa-St. Petersburg-Clearwater, FL	3,527
Kansas City, MO-KS	3,514
Trenton-Princeton, NJ	3,506
Kalamazoo-Portage, MI	3,420
Bloomington, IN	3,343
Madison, WI	3,312
Columbus, OH	2,788

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 21. States with Large and Specialized Employment in Pharmaceuticals, 2025

State	Establishments, 2025	Employment, 2025	Location Quotient, 2025	Share of U.S. Employment
New Jersey	470	30,058	2.99	8.3%
North Carolina	167	26,999	2.35	7.4%
Illinois	399	24,257	1.70	6.7%
Indiana	114	23,709	3.13	6.5%
Pennsylvania	156	20,362	1.39	5.6%

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 23. Metropolitan Statistical Areas with the Highest Location Quotients in Pharmaceuticals, by Size of MSA, 2025

Metropolitan Statistical Area	Location Quotient	2025 Employment
Large MSAs (Total Private Employment Greater than 250,000)		
Durham-Chapel Hill, NC	9.22	6,990
Indianapolis-Carmel-Greenwood, IN	6.57	17,266
Albany-Schenectady-Troy, NY	5.33	5,128
Madison, WI	3.80	3,312
Portland-South Portland, ME	3.66	2,497
Provo-Orem-Lehi, UT	3.31	2,421
Raleigh-Cary, NC	3.20	5,606
Worcester, MA	3.04	2,485
Greenville-Anderson-Greer, SC	2.50	2,549
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	2.39	16,645
San Diego-Chula Vista-Carlsbad, CA	2.29	8,034
San Francisco-Oakland-Fremont, CA	2.25	12,607
Chicago-Naperville-Elgin, IL-IN	2.03	21,900
Columbia, SC	2.03	1,752
Buffalo-Cheektowaga, NY	1.76	2,141
Medium MSAs (Total Private Employment Between 75,000 and 250,000)		
Kalamazoo-Portage, MI	11.53	3,420
Trenton-Princeton, NJ	6.94	3,506
Norwich-New London-Willimantic, CT	5.99	1,649
Boulder, CO	4.80	2,088
Santa Cruz-Watsonville, CA	4.07	951
Lincoln, NE	3.70	1,481
Vallejo, CA	3.28	1,068
Ogden, UT	3.19	1,871
Hickory-Lenoir-Morganton, NC	3.12	1,112
Waco, TX	3.08	912
Evansville, IN	2.92	962
Fargo, ND-MN	2.58	905
Fort Collins-Loveland, CO	2.34	867
Lexington-Fayette, KY	2.24	1,423
Lansing-East Lansing, MI	1.96	875
Small MSAs (Total Private Employment Less than 75,000)		
Bloomington, IN	22.33	3,343
Rocky Mount, NC	22.23	2,666
Greenville, NC	17.73	2,707
Kankakee, IL	16.50	1,570
St. Joseph, MO-KS	8.17	1,033
Iowa City, IA	7.11	1,140
Lebanon, PA	5.31	653
Auburn-Opelika, AL	3.82	551
Logan, UT-ID	3.74	560
Morgantown, WV	3.20	472
Terre Haute, IN	2.87	421
Ames, IA	2.51	268
Athens-Clarke County, GA	2.10	411
Winchester, VA-WV	2.02	315
Janesville-Beloit, WI	1.86	312

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Medical Devices & Equipment

Firms in the medical device and equipment subsector produce a variety of biomedical instruments and other healthcare products and supplies for diagnostics, surgery, patient care, and laboratories. The subsector is continually advancing the application of electronics and information technologies to improve and automate testing and patient care capabilities.[15]

Examples of Products

- Bioimaging equipment
- Surgical supplies and instruments
- Orthopedic/prosthetic implants and devices
- Genomic sequencing equipment
- Automated external defibrillators (AEDs)
- Vascular stents and other implantable devices
- Dental instruments and orthodontics
- Contact lenses and other ophthalmic goods

Examples of Companies

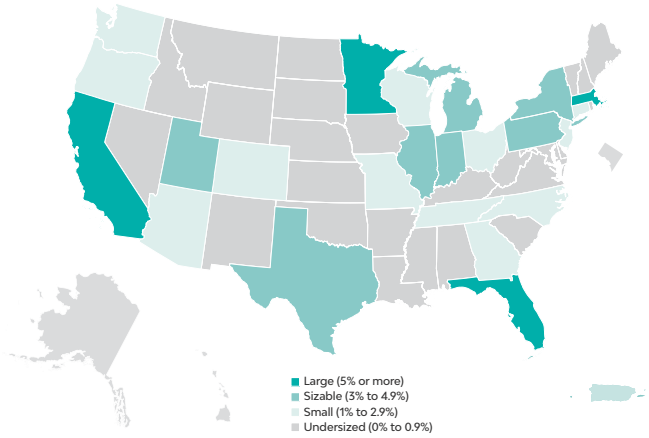
- Baxter
- Boston Scientific Corp.
- Cook Medical
- GE HealthCare
- INSIGHTEC
- Medtronic
- Outset Medical
- Regenesis
- Solventum Corporation
- Stryker
- Zimmer Biomet

States that are Both Large and Specialized*

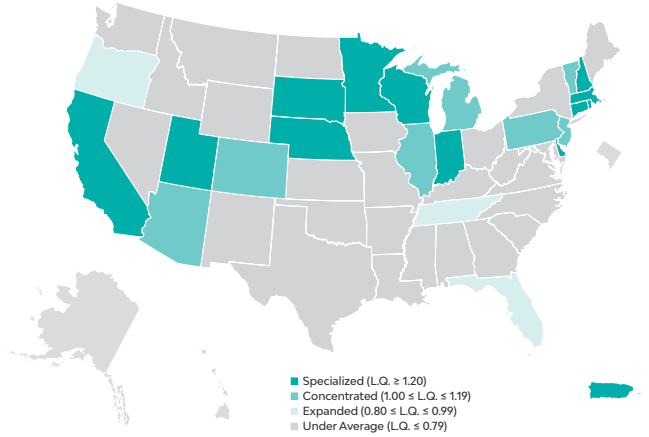
- California
- Minnesota
- Massachusetts

*States are listed in descending order by subsector employment levels.

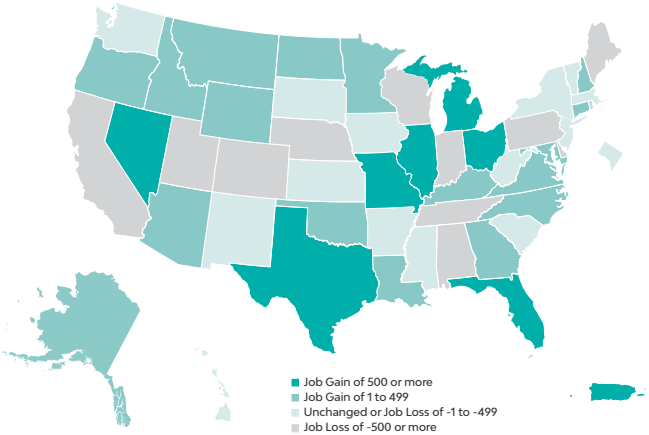
State Share of Total U.S. Employment, 2025



Employment Concentration Relative to the U.S., 2025



Employment Gains and Losses, 2021-2025



15 Beginning with this edition of the biennial report, the Medical Devices & Equipment subsector also includes Ophthalmic Goods Manufacturing (NAICS 339115). This industry covers the manufacture of products used to diagnose, correct, protect, and support vision—including ophthalmic lenses, contact lenses, and protective eyewear—and is classified by NAICS within Medical Equipment and Supplies Manufacturing (NAICS 3391).

Medical Devices & Equipment

State Leaders & Highlights

Employment Size: The medical device subsector has a well-distributed geographic footprint, with large or sizable states from every region. The top ten employing states account for 62 percent of employment in this subsector.

- **Large States:** California, Minnesota, Massachusetts, Florida
- **Sizable States:** Texas, Illinois, Pennsylvania, Puerto Rico, Indiana, New York, Michigan, Utah

Employment Concentration: Twelve states and Puerto Rico have a specialized concentration of jobs in the medical device and equipment subsector.

- **Specialized States:** Puerto Rico, Minnesota, Utah, Massachusetts, Indiana, Delaware, Connecticut, California, South Dakota, Nebraska, New Hampshire, Rhode Island, Wisconsin
- **Concentrated States:** Illinois, Arizona, Vermont, Michigan, New Jersey, Colorado, Pennsylvania

Employment Growth: Over the 2021 to 2025 time period, 23 states and Puerto Rico experienced some increase in subsector employment, led by Illinois, Texas, Puerto Rico, Florida, and Michigan.

Large and Specialized States: Three states have both a large employment share and a specialized concentration of jobs in medical devices and equipment (Table 24).

Table 25. Metropolitan Statistical Areas with the Largest Employment Levels in Medical Devices & Equipment, 2025

Metropolitan Statistical Area	2025 Employment
Los Angeles-Long Beach-Anaheim, CA	33,142
Minneapolis-St. Paul-Bloomington, MN-WI	31,693
Boston-Cambridge-Newton, MA-NH	19,729
Chicago-Naperville-Elgin, IL-IN	17,617
New York-Newark-Jersey City, NY-NJ	13,743
San Francisco-Oakland-Fremont, CA	13,201
Salt Lake City-Murray, UT	10,711
San Diego-Chula Vista-Carlsbad, CA	10,676
San Jose-Sunnyvale-Santa Clara, CA	10,023
Dallas-Fort Worth-Arlington, TX	8,660
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	7,650
Memphis, TN-MS-AR	5,707
Miami-Fort Lauderdale-West Palm Beach, FL	5,483
Phoenix-Mesa-Chandler, AZ	5,468
Pittsburgh, PA	5,337
Seattle-Tacoma-Bellevue, WA	5,201
Portland-Vancouver-Hillsboro, OR-WA	4,855
Tampa-St. Petersburg-Clearwater, FL	4,854
Milwaukee-Waukesha, WI	4,851
Bloomington, IN	4,665
Denver-Aurora-Centennial, CO	4,413
Kalamazoo-Portage, MI	4,260
Cleveland, OH	4,169
Atlanta-Sandy Springs-Roswell, GA	4,148
Jacksonville, FL	3,906

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 24. States with Large and Specialized Employment in Medical Devices & Equipment, 2025

State	Establishments, 2025	Employment, 2025	Location Quotient, 2025	Share of U.S. Employment
California	1,637	81,327	1.63	18.9%
Minnesota	443	32,550	3.97	7.6%
Massachusetts	429	23,997	2.35	5.6%

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 26. Metropolitan Statistical Areas with the Highest Location Quotients in Medical Devices & Equipment, by Size of MSA, 2025

Metropolitan Statistical Area	Location Quotient	2025 Employment
Large MSAs (Total Private Employment Greater than 250,000)		
Minneapolis-St. Paul-Bloomington, MN-WI	5.80	31,693
Salt Lake City-Murray, UT	4.70	10,711
Memphis, TN-MS-AR	3.37	5,707
San Jose-Sunnyvale-Santa Clara, CA	3.01	10,023
Rochester, NY	2.69	3,704
San Diego-Chula Vista-Carlsbad, CA	2.58	10,676
Boston-Cambridge-Newton, MA-NH	2.57	19,729
Worcester, MA	2.39	2,314
Milwaukee-Waukesha, WI	2.05	4,851
San Francisco-Oakland-Fremont, CA	2.00	13,201
Providence-Warwick, RI-MA	1.91	3,795
Los Angeles-Long Beach-Anaheim, CA	1.90	33,142
Jacksonville, FL	1.80	3,906
Tucson, AZ	1.78	1,802
Bridgeport-Stamford-Danbury, CT	1.70	1,982
Medium MSAs (Total Private Employment Between 75,000 and 250,000)		
Kalamazoo-Portage, MI	12.15	4,260
Naples-Marco Island, FL	4.99	2,543
Boulder, CO	3.51	1,807
New Haven, CT	3.42	2,716
Santa Maria-Santa Barbara, CA	2.71	1,564
Gainesville, FL	2.66	982
St. Cloud, MN	2.53	746
Scranton--Wilkes-Barre, PA	2.37	1,716
Reading, PA	2.32	1,166
Manchester-Nashua, NH	2.28	1,304
South Bend-Mishawaka, IN-MI	2.27	856
Syracuse, NY	2.11	1,678
Santa Rosa-Petaluma, CA	2.08	1,193
Ogden, UT	2.01	1,392
Waterbury-Shelton, CT	1.94	870
Small MSAs (Total Private Employment Less than 75,000)		
Bloomington, IN	26.34	4,665
Flagstaff, AZ	14.02	2,347
Glens Falls, NY	9.30	1,289
Sumter, SC	7.21	683
Staunton-Stuarts Draft, VA	5.11	736
State College, PA	3.91	568
Sheboygan, WI	3.45	613
Florence, SC	2.98	681
Jackson, MI	2.87	437
Elmira, NY	2.39	210
Logan, UT-ID	2.21	391
Niles, MI	2.07	348
Lebanon, PA	1.95	283
Saginaw, MI	1.66	373
Grants Pass, OR	1.59	140

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Research, Testing, & Medical Laboratories

The research, testing, and medical laboratories subsector includes firms performing a range of activities; from highly research-oriented companies working to develop and commercialize new industrial biotechnologies, drug discovery/delivery systems, and gene and cell therapies, to more service-oriented firms engaged in medical and other life sciences testing services. The subsector is closely tied to pharmaceuticals and unique in that some companies will "graduate" or shift out of the subsector and into pharmaceuticals when technologies or discoveries are successfully commercialized.

Examples of Products

- Stem cell/regenerative research
- Molecular diagnostics and testing
- Preclinical drug development
- Drug delivery systems
- DNA synthesis
- Research/laboratory support services

Examples of Companies

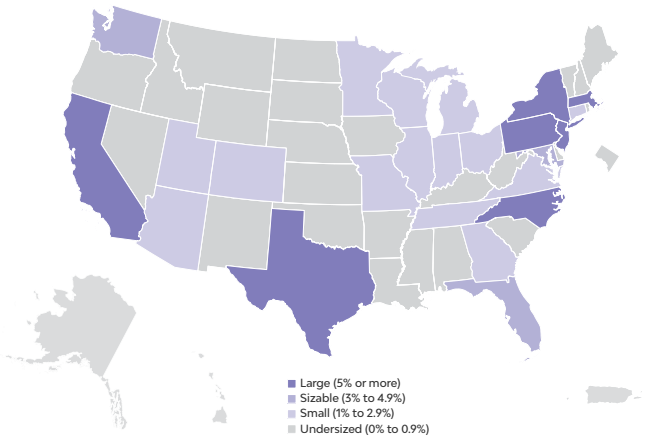
- AGC Biologics
- Catalent
- Charles River
- Fujifilm
- IQVIA
- KBI BioPharma
- National Resilience
- PPD
- Samsung Biologics
- Labcorp
- Quest Diagnostics

States that are Both Large and Specialized*

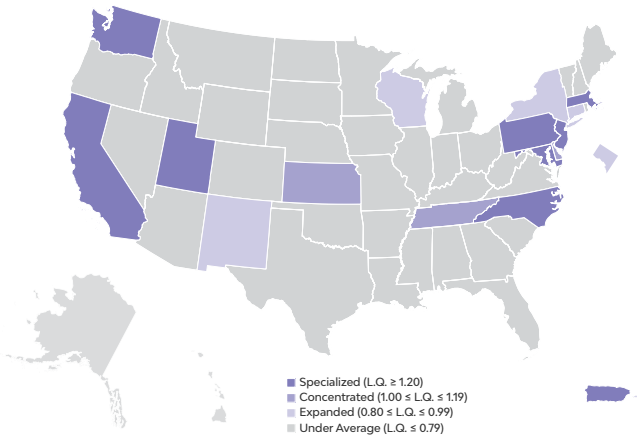
- California
- Massachusetts
- Pennsylvania
- New Jersey
- North Carolina

*States are listed in descending order by subsector employment levels.

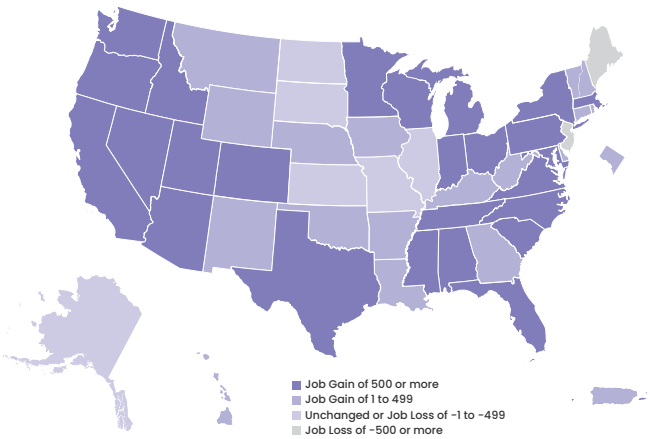
State Share of Total U.S. Employment, 2025



Employment Concentration Relative to the U.S., 2025



Employment Gains and Losses, 2021-2025



Research, Testing, & Medical Laboratories

State Leaders & Highlights

Employment Size: With the largest employment base among the five subsectors, the research, testing, and medical labs subsector has a significant presence in most states. The top ten employer states make up 67 percent of national employment, and the top 21 all have more than 10,000 subsector jobs.

- **Large States:** California, Massachusetts, New York, Pennsylvania, New Jersey, Texas, North Carolina
- **Sizable States:** Florida, Maryland, Washington

Employment Concentration: Eight states and Puerto Rico have a specialized concentration of jobs in the research, testing, and medical laboratories subsector.

- **Specialized States:** Massachusetts, Maryland, New Jersey, North Carolina, California, Utah, Washington, Puerto Rico, Pennsylvania
- **Concentrated States:** Delaware, Kansas, Tennessee

Employment Growth: Over the 2021 to 2025 time period, 42 states, DC, and Puerto Rico experienced some increase in subsector employment, led by Massachusetts, Texas, Florida, Washington, and California.

Large and Specialized States: Five states have both a large employment share and a specialized concentration of jobs in research, testing, and medical laboratories (Table 27).

Table 28. Metropolitan Statistical Areas with the Largest Employment Levels in Research, Testing, & Medical Laboratories, 2025

Metropolitan Statistical Area	2025 Employment
Boston-Cambridge-Newton, MA-NH	84,011
New York-Newark-Jersey City, NY-NJ	55,795
San Francisco-Oakland-Fremont, CA	50,186
San Diego-Chula Vista-Carlsbad, CA	30,478
Los Angeles-Long Beach-Anaheim, CA	28,508
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	28,291
Washington-Arlington-Alexandria, DC-VA-MD-WV	24,797
Seattle-Tacoma-Bellevue, WA	18,059
Chicago-Naperville-Elgin, IL-IN	14,415
San Jose-Sunnyvale-Santa Clara, CA	12,971
Durham-Chapel Hill, NC	12,942
Baltimore-Columbia-Towson, MD	11,950
Houston-Pasadena-The Woodlands, TX	11,538
Salt Lake City-Murray, UT	11,257
Dallas-Fort Worth-Arlington, TX	10,114
Miami-Fort Lauderdale-West Palm Beach, FL	9,875
Phoenix-Mesa-Chandler, AZ	9,861
Madison, WI	8,704
Raleigh-Cary, NC	8,365
Knoxville, TN	7,826
Atlanta-Sandy Springs-Roswell, GA	7,364
Tampa-St. Petersburg-Clearwater, FL	7,162
Minneapolis-St. Paul-Bloomington, MN-WI	6,890
Pittsburgh, PA	6,618
Kansas City, MO-KS	6,331

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 27. States with Large and Specialized Employment in Research, Testing, & Medical Laboratories, 2025

State	Establishments, 2025	Employment, 2025	Location Quotient, 2025	Share of U.S. Employment
California	7,111	140,457	1.55	18.0%
Massachusetts	3,734	93,390	5.04	12.0%
Pennsylvania	2,489	39,698	1.27	5.1%
New Jersey	2,294	39,217	1.82	5.0%
North Carolina	3,368	38,912	1.58	5.0%

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 29. Metropolitan Statistical Areas with the Highest Location Quotients in Research, Testing, & Medical Laboratories, by Size of MSA, 2025

Metropolitan Statistical Area	Location Quotient	2025 Employment
Large MSAs (Total Private Employment Greater than 250,000)		
Durham-Chapel Hill, NC	7.97	12,942
Boston-Cambridge-Newton, MA-NH	6.05	84,011
Madison, WI	4.66	8,704
San Francisco-Oakland-Fremont, CA	4.19	50,186
San Diego-Chula Vista-Carlsbad, CA	4.06	30,478
Knoxville, TN	3.67	7,826
Salt Lake City-Murray, UT	2.73	11,257
Albany-Schenectady-Troy, NY	2.46	5,074
Worcester, MA	2.45	4,294
Raleigh-Cary, NC	2.23	8,365
San Jose-Sunnyvale-Santa Clara, CA	2.15	12,971
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	1.90	28,291
Baltimore-Columbia-Towson, MD	1.83	11,950
Dayton-Kettering-Beavercreek, OH	1.74	3,189
Seattle-Tacoma-Bellevue, WA	1.73	18,059
Medium MSAs (Total Private Employment Between 75,000 and 250,000)		
Trenton-Princeton, NJ	4.44	4,806
Kennewick-Richland, WA	4.12	2,831
Boulder, CO	3.45	3,213
Oshkosh-Neenah, WI	3.18	1,531
Wilmington, NC	2.85	2,779
Barnstable Town, MA	2.11	1,006
Syracuse, NY	1.71	2,472
College Station-Bryan, TX	1.71	914
Rochester, MN	1.58	1,022
Norwich-New London-Willimantic, CT	1.55	915
New Haven, CT	1.47	2,116
Lafayette-West Lafayette, IN	1.44	679
Augusta-Richmond County, GA-SC	1.29	1,461
Ann Arbor, MI	1.28	1,001
Huntsville, AL	1.25	1,542
Small MSAs (Total Private Employment Less than 75,000)		
Burlington, NC	9.68	3,372
Idaho Falls, ID	4.89	2,090
Lexington Park, MD	3.37	980
Kankakee, IL	1.81	369
Logan, UT-ID	1.52	489
Ithaca, NY	1.50	365
Mount Vernon-Anacortes, WA	1.46	351
Morgantown, WV	1.46	459
Bangor, ME	1.27	439
Warner Robins, GA	1.23	349
Ames, IA	1.13	259
Pueblo, CO	1.04	300
Florence, SC	1.04	429
Santa Fe, NM	1.00	270
Athens-Clarke County, GA	0.93	391

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Bioscience-Related Distribution

The bioscience-related distribution subsector coordinates the delivery of bioscience-related products spanning pharmaceuticals, medical devices and equipment, and ag biotech products. The subsector leverages and deploys specialized technologies such as cold storage, highly regulated product monitoring, radio frequency identification (RFID) technologies, and automated drug distribution systems.

Examples of Products

Distribution of:

- Pharmaceuticals
- Vaccines
- Plasma/blood
- Veterinary medicines
- Surgical instruments/appliances
- Diagnostic and bioimaging equipment
- Plant seeds
- Agricultural chemicals

Examples of Companies

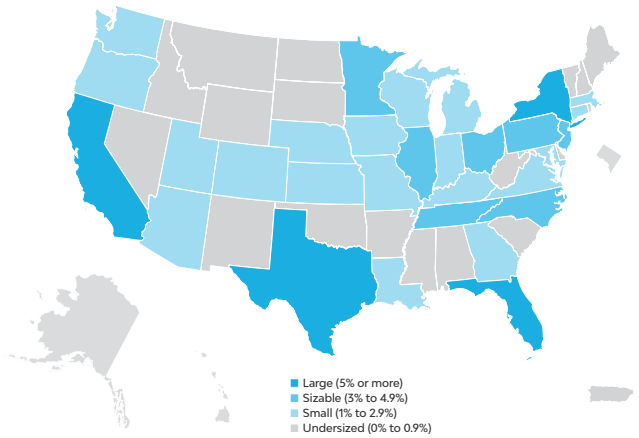
- Apria Healthcare
- Cardinal Health
- Cencora
- McKesson
- Owens & Minor
- Park Seed
- Patterson Companies
- PharMerica Corporation
- Seminis
- Wilbur-Ellis

States that are Both Large and Specialized*

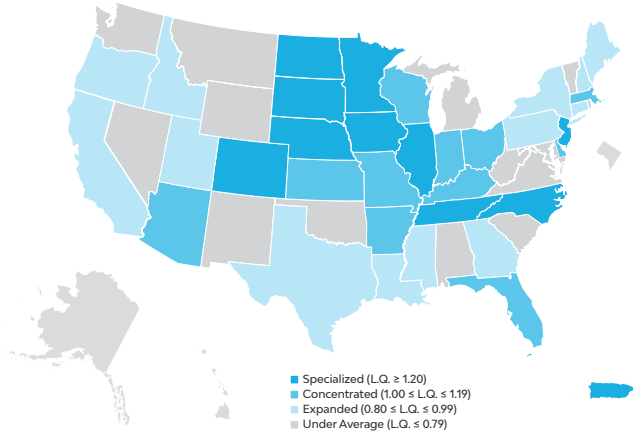
- Florida†
- Illinois‡

*States are listed in descending order by subsector employment levels.
† Florida is the only state with a large share of national employment that also has an above-average location quotient – 1.13.
‡ Illinois is the specialized state with the largest share of national employment at 4.7 percent.

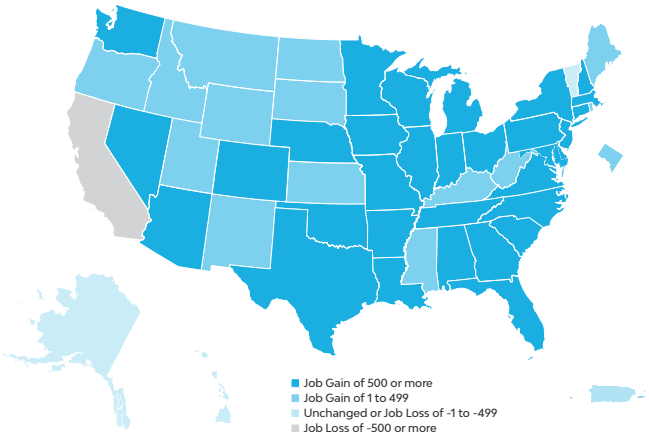
State Share of Total U.S. Employment, 2025



Employment Concentration Relative to the U.S., 2025



Employment Gains and Losses, 2021-2025



Bioscience-Related Distribution

State Leaders & Highlights

Employment Size: The distribution subsector's employment base–the second-largest of the five bioscience subsectors–is well distributed across the U.S., with the top 10 employing states making up just 55 percent of all employment and every state having a presence to some degree.

- **Large States:** California, Texas, Florida, New York
- **Sizable States:** Illinois, New Jersey, Ohio, North Carolina, Pennsylvania, Tennessee, Minnesota

Employment Concentration: Ten states and Puerto Rico have a specialized concentration of jobs in the bioscience-related distribution subsector.

- **Specialized States:** South Dakota, Iowa, Nebraska, North Dakota, New Jersey, Minnesota, Puerto Rico, Tennessee, Colorado, North Carolina, Illinois
- **Concentrated States:** Ohio, Missouri, Arkansas, Massachusetts, Wisconsin, Florida, Indiana, Kansas, Delaware, Arizona, Kentucky

Employment Growth: Over the 2021 to 2025 time period, 46 states and DC experienced some increase in subsector employment, led by North Carolina, Pennsylvania, New York, Florida, and Texas.

Large and Specialized States: No state has both a large employment base (at least 5 percent of national employment) and a specialized location quotient (1.20 or greater). Florida is the only state with a large share of national employment and an above-average location quotient, while Illinois is the specialized state with the largest share of national employment (Table 30).

Table 31. Metropolitan Statistical Areas with the Largest Employment Levels in Bioscience-Related Distribution, 2025

Metropolitan Statistical Area	2025 Employment
New York-Newark-Jersey City, NY-NJ	36,759
Chicago-Naperville-Elgin, IL-IN	21,089
Los Angeles-Long Beach-Anaheim, CA	20,485
Dallas-Fort Worth-Arlington, TX	16,837
Miami-Fort Lauderdale-West Palm Beach, FL	13,540
Boston-Cambridge-Newton, MA-NH	12,773
Minneapolis-St. Paul-Bloomington, MN-WI	12,688
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	12,580
Atlanta-Sandy Springs-Roswell, GA	11,330
Phoenix-Mesa-Chandler, AZ	11,152
Denver-Aurora-Centennial, CO	9,864
Houston-Pasadena-The Woodlands, TX	9,795
Detroit-Warren-Dearborn, MI	6,750
Seattle-Tacoma-Bellevue, WA	5,939
San Francisco-Oakland-Fremont, CA	5,835
Tampa-St. Petersburg-Clearwater, FL	5,807
Nashville-Davidson--Murfreesboro--Franklin, TN	5,767
Raleigh-Cary, NC	5,766
San Diego-Chula Vista-Carlsbad, CA	5,626
Columbus, OH	5,490
Indianapolis-Carmel-Greenwood, IN	5,423
Kansas City, MO-KS	5,136
Charlotte-Concord-Gastonia, NC-SC	5,105
St. Louis, MO-IL	4,993
Memphis, TN-MS-AR	4,976

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 30. States with Large and Specialized Employment in Bioscience-Related Distribution, 2025

State	Establishments, 2025	Employment, 2025	Location Quotient, 2025	Share of U.S. Employment
Florida	4,004	49,627	1.13	7.4%
Illinois	2,126	31,652	1.21	4.7%

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Table 32. Metropolitan Statistical Areas with the Highest Location Quotients in Bioscience-Related Distribution, by Size of MSA, 2025

Metropolitan Statistical Area	Location Quotient	2025 Employment
Large MSAs (Total Private Employment Greater than 250,000)		
Durham-Chapel Hill, NC	2.13	2,965
Des Moines-West Des Moines, IA	1.99	3,487
Memphis, TN-MS-AR	1.89	4,976
Raleigh-Cary, NC	1.79	5,766
Minneapolis-St. Paul-Bloomington, MN-WI	1.50	12,688
Denver-Aurora-Centennial, CO	1.43	9,864
Salt Lake City-Murray, UT	1.32	4,685
Louisville/Jefferson County, KY-IN	1.25	3,783
Nashville-Davidson--Murfreesboro--Franklin, TN	1.20	5,767
Oxnard-Thousand Oaks-Ventura, CA	1.19	1,711
Columbus, OH	1.17	5,490
Rochester, NY	1.14	2,441
Fresno, CA	1.14	2,235
Knoxville, TN	1.13	2,062
Indianapolis-Carmel-Greenwood, IN	1.13	5,423
Medium MSAs (Total Private Employment Between 75,000 and 250,000)		
Naples-Marco Island, FL	3.12	2,466
Trenton-Princeton, NJ	2.39	2,220
Olympia-Lacey-Tumwater, WA	2.21	949
Boulder, CO	2.10	1,680
Kiryas Joel-Poughkeepsie-Newburgh, NY	1.77	2,000
Slidell-Mandeville-Covington, LA	1.75	719
Fort Collins-Loveland, CO	1.59	1,076
Sioux Falls, SD-MN	1.47	1,185
Lakeland-Winter Haven, FL	1.30	1,530
Stockton-Lodi, CA	1.29	1,568
Fargo, ND-MN	1.26	810
Springfield, IL	1.21	456
Topeka, KS	1.06	470
Montgomery, AL	1.04	653
Kennewick-Richland, WA	1.04	613
Small MSAs (Total Private Employment Less than 75,000)		
Harrisonburg, VA	4.56	1,243
Albany, GA	3.55	831
Albany, OR	3.01	630
Yuma, AZ	2.46	687
Dubuque, IA	2.27	600
El Centro, CA	2.11	494
Iowa City, IA	2.05	603
Jonesboro, AR	1.99	520
Minot, ND	1.75	236
Kenosha, WI	1.74	588
Ames, IA	1.69	330
Bloomington, IN	1.64	450
Texarkana, TX-AR	1.56	357
Champaign-Urbana, IL	1.54	573
St. Joseph, MO-KS	1.48	342

Source: TEConomy analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced by Lightcast (Datarun 2026.3).

Appendix: Data & Methodology

Industry Employment, Establishments, and Wages

The bioscience industry employment analysis in this report examines national, state, and metropolitan area data and corresponding trends in the biosciences from 2001 through 2025. For employment analysis, TEConomy Partners used the Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) data. The QCEW data provide the most current, detailed industry employment, establishment, and wage figures available at both a national and subnational level. TEConomy utilizes an enhanced version of these data from a private vendor, Lightcast.

The QCEW program is a cooperative program involving BLS and the State Employment Security Agencies. The QCEW program produces a comprehensive tabulation of employment and wage information for workers covered by state unemployment insurance (UI) laws and federal workers covered by the Unemployment Compensation for Federal Employees (UCFE) program. Publicly available files include data on the number of establishments, monthly employment, and quarterly wages, by NAICS (North American Industry Classification System) industry, by county and by ownership sector, for the entire United States. These data are aggregated to annual levels, to higher industry levels (NAICS industry groups, sectors and supersectors) and to higher geographic levels (national, state, and metropolitan statistical area [MSA]).

Since 2001, the QCEW has been producing and publishing data according to the NAICS. Compared with the prior classification system—the 1987 Standard Industrial Classification (SIC) system, NAICS better incorporates new and emerging industries. Employment, establishment, and wage data produced by the QCEW program for 2001 to present are not comparable with SIC-based industry data from prior years. This limits the ability to construct a longer time series for data analysis; however, 25 years of NAICS-based data (2001-2025) are now available.

Twenty-seven NAICS industries at the most detailed (6-digit) level make up the TEConomy definition of the biosciences and its subsectors. These detailed industries are aggregated up to five major subsectors of the bioscience industry. Six of the detailed NAICS industries, Testing Laboratories (NAICS 541380); Research and Development in Nanotechnology (541713); Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715); Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers (423450); Drug and Druggists' Sundries Merchant Wholesalers (424210); and Farm Supplies Merchant Wholesalers (424910) are adjusted in this analysis by TEConomy to include only the share of these industries directly involved in biological or other life science activities. To isolate these relevant life science components, TEConomy used the most current available data from the U.S. Census Bureau's Economic Census.

Beginning with this edition, the Medical Devices & Equipment subsector also includes Ophthalmic Goods Manufacturing (NAICS 339115). This industry covers the manufacture of products used to diagnose, correct, protect, and support vision—including ophthalmic lenses, contact lenses, and protective eyewear—and is classified by NAICS within Medical Equipment and Supplies Manufacturing (NAICS 3391).

National and state data were tabulated and presented in both summary analytical and state profile tables. Data for Puerto Rico and the District of Columbia are included in this report at both the "state" and national level. U.S. employment, establishment, and wage totals in this report reflect the sum of all state data and include

both Puerto Rico and DC. For all states and DC, the enhanced data from Lightcast were utilized. Because Lightcast does not provide enhanced data for Puerto Rico, the original QCEW files from BLS were used instead.

For more information on the BLS Quarterly Census of Employment and Wages, see http://www.bls.gov/cew/.

Table A-1. Bioscience Industry Definition

Bioscience Subsector	NAICS Code	NAICS Description
Agricultural Feedstock & Industrial Biosciences	311221	Wet Corn Milling and Starch Manufacturing
	311224	Soybean and Other Oilseed Processing
	325193	Ethyl Alcohol Manufacturing
	325311	Nitrogenous Fertilizer Manufacturing
	325312	Phosphatic Fertilizer Manufacturing
	325314	Fertilizer (Mixing Only) Manufacturing
	325315	Compost Manufacturing
	325320	Pesticide and Other Agricultural Chemical Manufacturing
Pharmaceuticals	325411	Medicinal and Botanical Manufacturing
	325412	Pharmaceutical Preparation Manufacturing
	325413	In-Vitro Diagnostic Substance Manufacturing
	325414	Biological Product (except Diagnostic) Manufacturing
Medical Devices & Equipment	334510	Electromedical and Electrotherapeutic Apparatus Manufacturing
	334516	Analytical Laboratory Instrument Manufacturing
	334517	Irradiation Apparatus Manufacturing
	339112	Surgical and Medical Instrument Manufacturing
	339113	Surgical Appliance and Supplies Manufacturing
	339114	Dental Equipment and Supplies Manufacturing
	339115	Ophthalmic Goods Manufacturing
Research, Testing, & Medical Laboratories	541380*	Testing Laboratories and Services
	541713*	Research and Development in Nanotechnology
	541714	Research and Development in Biotechnology (except Nanobiotechnology)
	541715*	Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)
	621511	Medical Laboratories
Bioscience-related Distribution	423450*	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers
	424210*	Drugs and Druggists' Sundries Merchant Wholesalers
	424910*	Farm Supplies Merchant Wholesalers

***Note:** Includes only the portion of these industries engaged in relevant life science activities.

Industry Economic Impacts and Multipliers

The economic impact of the U.S. bioscience industry is estimated using national employment at a detailed industry sector level as inputs; and was developed using input-output (I-O)-based economic impact models from IMPLAN (U.S. national and Puerto Rico). The IMPLAN models' data matrices track the flow of commodities to industries from producers and institutional consumers within the nation. The data also model consumption activities by workers and owners of capital and imports. The inter-industry trade flows built into the model permit estimating the impacts of one sector on all other sectors with which it interacts.

The model's estimated results provide the impacts typically measured in an economic impact study quantifying direct, indirect, and induced job creation, associated personal incomes, business value added and output, and associated revenues to local/county, state, and federal taxing jurisdictions. For the non-tax revenue estimations, a multiplier is provided that relates the total impacts to the direct effects that generated them. For example, an employment multiplier of 4.18 indicates that for every 1 direct job in the industry an additional 3.18 jobs are supported within the economy.

Bioscience Academic R&D Expenditures

Based upon data from the National Science Foundation's (NSF) Higher Education Research and Development Survey, national and state totals (summation of all state's responding institutions) are calculated for FY 2024 (most current year available) as well as the previous three years (FY 2021 – FY 2024). Data are provided for total R&D expenditures (including per capita measures) as well as in chart form for the bioscience fields including Health Sciences, Biological and Biomedical Sciences, Agricultural Sciences, Biological/Biomedical Engineering, Natural Resources and Conservation, and Other Life Sciences.

For more information on the NSF Higher Education Research and Development Survey, see https://ncses.nsf.gov/surveys/higher-education-research-development/2024.

National Institutes of Health (NIH) Funding

NIH extramural funding data for FY 2025 (the most current full year available) and for previous years were obtained using the NIH RePORTER tool within the RePORT database. Data are provided for total NIH extramural funding, while growth from FY 2021 through FY 2025 and FY 2025 per capita measures are also calculated.

For more information on the NIH Awards data, see https://reporter.nih.gov/.

Bioscience Venture Capital Investments

Venture capital investments, while not the only source of equity capital for bioscience firms, are often the largest and typically the most publicly known and reported source of investment funds allowing for comparability among states.

Venture capital data were collected from the PitchBook venture capital database for completed U.S. venture capital transactions between January 1, 2021 and December 31, 2025. The query included all VC stages, including pre/accelerator/incubator, angel, seed, early stage, and later stage. Companies were identified through a combination of PitchBook industry, vertical, and keyword criteria. The initial universe included companies classified within PitchBook's Healthcare Devices and Supplies, Healthcare Technology Systems, Pharmaceuticals and Biotechnology, Other Healthcare, Healthcare Distributors, Healthcare Laboratory Services, and Agricultural Chemicals industries, as well as companies identified through PitchBook's Digital Health, HealthTech, and Oncology vertical classifications. Companies classified by PitchBook under the Healthcare Services industry group were excluded unless their principal offering involves a qualifying digital health or technology platform activity. Keyword searches targeted companies associated with agricultural biotechnology not captured within the standard industry options.

Additionally, some adjustments have been made to analyses centered on industry segment. This includes the decision to group several sub-categories of what was formerly called "Biobased Products" into "Agricultural Biotech" due to growth in the bioeconomy and the increased blurring of lines between biofuels, biopolymers, and other biobased products.

Bioscience Patents

The use of patent data provides a surrogate (though not perfect) approach to understanding those innovations that bioscience-related industrial organizations, research institutions, and general inventors deem significant enough to register and protect. Patents provide some measure of comparability among regions in one facet of innovation in terms of activity levels within distinct technology areas. Furthermore, examining recent patent activity provides some insight into firms' recent R&D investment areas and strategies, and hence, potential future lines of business.

Each patent document references at least two distinct entities who are associated with the intellectual property (IP) that was generated—the inventor(s) of the patent, or the person(s) who generated the IP disclosed in the patent, and the assignee(s) of the patent, or the entity(ies) which currently have ownership of the IP outlined in the patent. Each patent can have multiple inventors and assignees, and multiple inventors are very common. For this analysis, TEConomy uses the address location of the named inventor(s) in the analysis of geographic distribution of bioscience patent areas across states, with the credit for invention being "shared" across all the unique states represented by the set of listed inventors in the patent document. Hence, if a bioscience patent is invented by individuals in two states, each state will receive "credit" for generating the patent, but at a national level the patent is counted only once. Similarly, when two or more named inventors are from the same state the patent only gets counted once.

It is important to note that this analysis uses only the inventors of the patent as a measure of bioscience innovation activity levels. As companies acquire ownership of IP being generated by others, patents can be assigned to different geographies without any addition of significant innovative value to the original patent. As a result, tracking patent innovation levels by inventor allows for a more consistent and accurate assessment of the places where innovative bioscience IP is being generated by researchers as opposed to being retained or licensed by companies which may or may not align with the same geographic context.

The United States Patent and Trademark Office (USPTO), using the Cooperative Patent Classification (CPC) scheme, assigns each patent with a specific numeric major patent "class" as well as supplemental secondary patent classes which detail the primary technology areas being documented by the patented IP. These classes are assigned to patents by dedicated classification staff who examine the documented IP's key focus and end uses. For example, a patent for a new biopharmaceutical may have a main patent class detailing the therapeutic activity or formulation of the drug with supplemental classes documenting any novel synthesizing or manufacturing processes critically tied to creation of the drug. The major patent class and supplemental patent classes are chosen by the USPTO classification staff during the process of reviewing patent applications. By combining relevant patent classes across the wide array of bioscience-related activity, these class designations allow for an aggregation scheme, developed by TEConomy for the purposes of bioscience innovation trends analysis, that is specific to key bioscience technologies.

Patent data were collected using the Clarivate's Derwent Patent Search patent analysis database and include all granted patents from January 1, 2021, through December 31, 2025, as documented by USPTO. Table A-2 provides a listing of the bioscience-related patent classes that were used in this analysis as well as how these classes are grouped into major areas of bioscience-related technologies (class group).

Table A-2. Bioscience-Related Patents—Classes and Groups

Bioscience Patent Class Group	Cooperative Patent Classification (CPC) Codes	Patent Class Description
Agricultural Chemicals and Fertilizers	A01N*	Preservation and disinfection; biocides; pest repellants or attractants; plant growth regulators
	C05B*	Phosphatic fertilizers
	C05C*	Nitrogenous fertilizers
	C05D*	Other inorganic fertilizers
	C05F*	Other organic fertilizers
	C05G*	Fertilizer mixtures and additives
Biochemistry	C07D*	Heterocyclic compounds
	C07H*	Sugars, nucleosides, nucleotides, and nucleic acids
	C07J*	Steroids
	C07K*	Peptides
Bioinformatics & Health IT	G16B*	Bioinformatics for genetic or protein-related data processing
	G16H*	Healthcare informatics and medical-data processing
Biological Sampling & Analysis	G01N 1/30–1/31 (partial)	Preparation of tissue, cell, and nucleic-acid samples for analysis
	G01N 15/01, 15/05 (partial)	Biological-cell particle investigation and blood sedimentation analysis
	G01N 21/64 (partial)	Fluorescence measurement of biological material
	G01N 27/32, 27/41 (partial)	Biochemical electrodes and biomolecule-adapted field-effect sensors
	G01N 33 (partial)	Biological-material and immunoassay analysis
	G01N 24*	Nuclear magnetic resonance analysis
	G01N 25*	Thermal and thermochemical analysis
	G01N 26*	Other electric or electrochemical analysis
	G01N 28*	Other material-analysis methods
Biopolymers	C08* (partial)	Selected organic macromolecular compounds with biological components
Drugs & Pharmaceuticals	A61K*	Preparations for medical, dental, or toilet purposes
	A61P*	Therapeutic activity of chemical compounds or medicinal preparations
Genetic Engineering	C12N 15*	Mutation or genetic engineering; DNA/RNA and vectors

Bioscience Patent Class Group	Cooperative Patent Classification (CPC) Codes	Patent Class Description
Medical & Surgical Devices	A61B*	Diagnosis; surgery; identification
	A61C*	Dentistry and oral or dental hygiene
	A61D*	Veterinary instruments, implements, tools, or methods
	A61F*	Prostheses, implants, orthopedic, nursing, contraceptive, and wound-care devices
	A61G*	Patient transport and accommodation; operating and dental chairs
	A61H*	Physical therapy, artificial respiration, massage, and therapeutic bathing devices
	A61J*	Medical or pharmaceutical containers and oral-administration devices
	A61L*	Sterilization, disinfection, deodorization, and surgical-dressing materials
	A61M*	Devices for introducing, removing, or transducing body media
	A61N*	Electrotherapy; magnetotherapy; radiation therapy; ultrasound therapy
	G06K 9/00, G06T 7/00, G06V 20/69 (partial)	Biomedical image processing
	G01K 13/2 (partial)	Clinical contact thermometers for use with humans or animals
	G01T 1/16 (partial)	Nuclear-medicine and radiation-diagnosis measurement
	H04R 25*	Electric hearing aids
	H01B 7/048; H01R 13/5224 (partial)	Implantable conductors and medical electrical connectors
	H01F 1/0045 (partial)	Magnetic materials and nanoparticles for medical or biological use
	H05B 1/025; H05B 3/0085 (partial)	Electric heating devices for medical applications
Microbiology & Enzymes	C12M*	Apparatus for enzymology or microbiology
	C12P*	Fermentation and enzyme-using synthesis processes
	C12Q*	Testing processes involving enzymes, nucleic acids, or microorganisms
	C12N* (partial)	Microorganisms, enzymes, and cell culture
Novel Animal Types (Animal Models)	A01K 67 (partial)	New or modified vertebrate and invertebrate animal breeds
	A01K 22 (partial)	Modified animals, including genetically modified animals
Novel Plant Types	A01H*	New plants and plant reproduction by tissue culture



TECONOMY

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