



MetroDenverEDC



2023 INDUSTRY CLUSTER STUDY

BIOSCIENCE

METRODENVER.ORG

ABOUT



The Metro Denver Economic Development Corporation (Metro Denver EDC) is the nation's first regional economic development entity, bringing together the entire nine-county Metro Denver and Northern Colorado region to promote and support the mutual growth of our region's talent and businesses, while also recruiting new talent and new business to join us living a prosperous and elevated life.

Metro Denver is a region on the rise, fueled by the passion of changemakers and boundary breakers that are in it for the long haul. With a culture that's always moving forward, the companies that call this community home are poised to make a real impact - one that goes beyond their own four walls - as we work together to build the best possible future for our region.

As part of the Metro Denver EDC brain trust, our 250+ investors get unmatched access to the decisions, directions and collaboration opportunities that are transforming the landscape of our economy, region and communities.

Join us to make your voice heard, collaborate with the region's top business executives, and be part of leading the changes you want to see happen.

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2023 INDUSTRY CLUSTER SCAN

BIOSCIENCE

By The Numbers

INDUSTRY SNAPSHOT US NUMBERS IN PARENTHESIS



COMPANIES: 950
AVERAGE WAGE: \$117,220
EMPLOYMENT CONCENTRATION RANKING: 18

Direct Employment: 20,220
Direct Employment Concentration (2022): 1.0% (0.7%)
5-Year Employment Growth (2017 - 2022): 20.6% (16.1%)
1-Year Employment Growth (2022): 2.9% (4.1%)

INDUSTRY OVERVIEW

The nine-county Metro Denver and Northern Colorado region's life sciences community continues to grow and mature. In 2022, Denver/Boulder ranked No. 11 among the top 25 U.S. Metros for Life Sciences Research Talent and ranked second-highest for density of bioengineers and biomedical engineers (CBRE, 2022). Denver-Boulder ranked No. 15 among the top life sciences cluster markets according to JLL's 2022 Life Sciences Research Outlook report due to strong momentum in core biotech talent and company formation over the past few years. Entrepreneurial and established companies continually choose the region for company expansions and relocations. Several major companies in the region including Medtronic, Agilent Technologies Inc., and Beckman Coulter Life Sciences announced new manufacturing facilities or significant expansions to accommodate increased demand and new product development. Global organizations are deepening their investments in the region and companies have raised significant capital over the last year. Several commercial developers are turning their attention to the bioscience industry in attempts to stay ahead of demand for laboratories and bioscience space in the region. Over the last year, several companies changed hands, operations expanded, and new bioscience construction continued to support research, development, and manufacturing capabilities.

The region's Bioscience cluster has been on the rise, growing more rapidly in the last two years than prior to the pandemic. Access to talent in the region is a major reason for that growth. While early in the sector's growth curve, employers relied more heavily on importing talent from outside the state, much of the new talent is now recruited locally. This is thanks to Colorado's range of higher-education institutions providing top-tier bioscience graduates, including Colorado School of Mines, University of Colorado Boulder, and Metropolitan State University of Denver.

CLUSTER DEFINITION

The Metro Denver and Northern Colorado region is comprised of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld counties. In this report, the Bioscience cluster consists of 12, six-digit North American Industry Classification System (NAICS) codes in two subclusters, each of which specializes in distinct aspects of the biosciences. The medical devices and diagnostics subcluster includes companies that engineer, research, design, and manufacture medical equipment and the pharmaceuticals and biotechnology subcluster includes companies that

manufacture, research, and develop pharmaceutical drugs. Biotechnology companies utilize cellular and molecular biology and medicinal chemistry to develop and commercialize therapeutic medicines.

These definitions allow for a comparative analysis of the Metro Denver and Northern Colorado region's Bioscience industry cluster relative to other metropolitan regions across the nation. This definition also avoids double-counting workers in other adjacent technology clusters such as Information Technology.

CLUSTER JOB TRENDS

- » Employment in the region's Bioscience cluster grew 2.9% between 2021 and 2022, rising for the 11th consecutive year.
- » The nine-county region employs more than 20,220 bioscience workers in approximately 950 companies.
- » Over the past five years, the cluster posted 20.6% growth in the region, adding 3,460 employees.
- » The Bioscience cluster employs 1% of the region's total employment base.
- » Over the past five years, the number of bioscience companies increased 23.1%.
- » 75% of the region's cluster companies have 10 or fewer employees.
- » Over 83% of the state's total employment in the Bioscience cluster was located in the region.

Notable Subcluster Trends

- » The medical devices and diagnostics subcluster represents 60.7% of the total bioscience employment base in the region, while pharmaceuticals and biotechnology represents 39.3%.
- » The pandemic accelerated employment growth for both subclusters in 2021, and growth remained strong in 2022.
- » The pharmaceuticals and biotechnology subcluster grew 5% in 2022 and the medical devices and diagnostics subcluster rose 1.6% over-the-year.
- » The pharmaceuticals and biotechnology subcluster grew 51.3% and the medical devices and diagnostics subcluster rose 6.6% over the past five years.
- » The pharmaceuticals and biotechnology subcluster had one of the highest average wage among any of the region's clusters/subclusters, reaching \$135,000 in 2021.

¹The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.

MAJOR INDUSTRY INVESTMENTS, EXPANSIONS & MILESTONES

Headquarter Relocations, Facility Expansions, New Campuses, and Hiring Announcements

- » **ViewRay Inc.**, a company that designs, manufactures, and markets a radiation therapy system that uses MRI technology to target cancerous tumors, moved its headquarters from Cleveland, Ohio to Denver. The company, which first expanded to Denver in 2019, also plans to establish a manufacturing facility in Aurora in the coming years.
- » **Medtronic Inc.** is consolidating its local business to a new medical-device research and development hub in Lafayette. The 400,000 square feet of new office and lab space will be a 10,000-square-foot increase over the company's previous R&D footprint in the region.
- » **Agilent Technologies Inc.** is planning a 198,000-square-foot expansion of its manufacturing facility on its campus in Frederick. The project is expected to add more than 160 jobs and double its manufacturing capacity for therapeutic nucleic acids.
- » **Beckman Coulter Life Sciences**, an Indianapolis-based company that develops and manufactures a wide array of instruments and software for the bioscience industry, opened its new \$10 million research and development facility at the Axis 25 development in Loveland in January 2023. The company, which currently employs about 140 people in Northern Colorado, will add 85 high-paying jobs in the fields of research, engineering, and product management. The company also plans to break ground on a 37,000-square-foot manufacturing operation in the second quarter of 2023 that will be attached to the new Loveland facility.
- » Lakewood-based **Terumo Blood and Cell Technologies** expanded its Metro Denver operations with a new 170,000-square-foot facility in Douglas County, adding to the company's existing 750,000-square-foot facility in Lakewood. The new facility opened in May 2022 with 100 employees with plans to become fully operational with 300 employees in January 2023.
- » **Biodesix Inc.**, a Boulder-headquartered company that specializes in developing tools to detect lung disease, leased an 80,000-square-foot former retail space in Louisville with plans to extensively renovate the space, including construction of a laboratory.





» Other companies leasing new space in 2022 include **SomaLogic** (200,000 square feet of new space), **Edgewise Therapeutics** (18,000 square feet), and **VitriVax** (10,000 square feet).

Venture Capital and Funding Awards

The region's life sciences community has seen a recent wave of major company acquisitions, mergers, and significant financings over the last few years. One of the biggest deals in Colorado's bioscience history was the July 2019 acquisition of Boulder-based Array BioPharma by Pfizer. This was the highest-value Colorado life sciences transaction at \$11.4 billion.

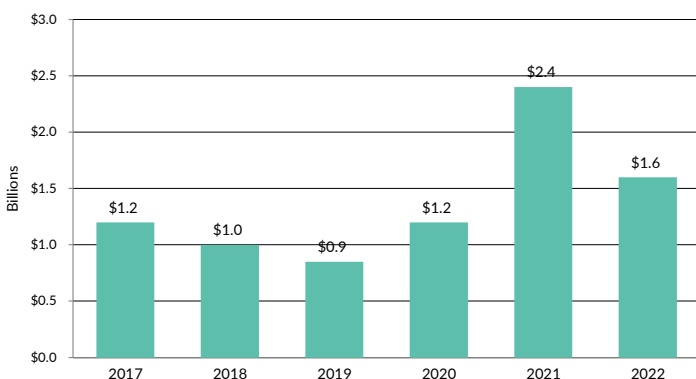
Venture Capital Totals, 2022

- » Pre-Seed and Seed - \$11.3 million
- » Series A and B - \$193.8 million
- » Series C, D, and E - \$81.5 million
- » Series F - \$40.7 million
- » Series Unknown - \$40.7 million

Colorado raised \$1.6 billion in capital across its life science ecosystem in 2022, down from a record \$2.4 billion raised in 2021. According to the Colorado Bioscience Association, this near return to pre-pandemic levels was consistent with nationwide trends following a booming year in 2021 when the COVID-19 pandemic prompted investor interest in scientific innovation. Still, fund raising in 2022 was the second highest on record and marked the sixth-consecutive year that the state's life sciences industry raised more than \$1 billion.

Despite an overall decline in funding over-the-year, there was an increase in both federal funding and pre-seed/seed capital, indicating government and investor confidence in breakthroughs being developed in Colorado. Pre-seed and seed-stage companies in Colorado raised \$11.3 million in 2022, up from \$2.4 million in 2021. The largest source of funding for Colorado bioscience companies was the federal government, which contributed \$556 million in 2022 through grants and contracts, up \$125.8 million from 2021. University of Colorado, Colorado State University, and National Jewish Health were Colorado's primary recipients of federal funding, which mainly came from the Biomedical Advanced Research and Development Authority, the Department of Defense, and the National Institutes of Health and National Science Foundation.

Colorado Life Sciences Financing



Source: Colorado Bioscience Association.

Other Notable Deals in 2022 Included

- » Two years after California genetics-testing company **Invitae Corp.** bought **ArcherDX Inc.**, a Boulder developer of genetic assays for cancer patients, the company's technology, local manufacturing, and research & development facility changed hands again. In a \$48 million deal, Iowa-based **Integrated DNA Technologies Inc.** absorbed Archer's trademarked next-generation sequencing (NGS) research essay and the company's Boulder operations in late 2022.
- » Westminster-based **TriSalus Life Sciences**, a company that develops technology to treat people with liver and pancreatic cancer, went public in a merger with **MedTech Acquisition Corporation**, a publicly traded specialty purpose acquisition company. The new company will continue under the TriSalus name.
- » Medical device manufacturer **Kestrel Labs** was acquired by another medical device company, Englewood-based **Zynex Inc.**, for \$31 million. Kestrel's proprietary product, the NiCO CO-Ocimeter, is a laser-based blood monitoring device that allows for blood measurements without invasive sampling. Zynex manufactures electrotherapy medical devices for pain management, rehabilitation, and fluid and sepsis monitoring.
- » The **University of Colorado Anschutz Medical Campus** announced the creation of the **Gates Institute**, a state-of-the-art facility that will focus on rapidly translating laboratory findings into regenerative, cellular, and gene therapies for patients. The Gates Institute is expected to grow to \$200 million over the next five years and will build on the success of the **Gates Center for Regenerative Medicine** and **Gates Biomanufacturing Facility**, which have conducted groundbreaking stem cell research for cancer and rare diseases, pioneering new therapies in recent years. Beyond research, the institute will support the manufacturing, delivery, and implementation of new therapies to patients, as well as identifying and providing regulatory infrastructure and investment resources necessary for commercializing novel therapies for patients.

The state's Advanced Industries Accelerator awarded \$8 million in grants to 26 life sciences companies and university researchers in 2022. As a designated Advanced Industry in Colorado, the life sciences ecosystem makes a significant contribution to the state's diverse and fast-growing economy, creating high-paying jobs for more than 27,000 Coloradans.

Bioscience Infrastructure and Lab Market Trends

The region has significant bioscience infrastructure and an increasing inventory of lab properties. In 2022, the Denver-

Advanced Industries Accelerator

Colorado's Office of Economic Development and International Trade (OEDIT) funds life sciences successes through the Advanced Industries Accelerator Grant Program. This critical source of non-dilutive capital allows companies to translate ideas into life-saving products and services, creating jobs, new companies, and follow-on investments. Since inception, the program's ROI for life sciences alone includes:



500+
Grants



81
New Companies



1,022
Jobs



\$1 BILLION
In Follow-On Capital

Boulder market ranked No. 10 on a list of top life science markets in the U.S., according to a midyear report from a real estate firm Newmark, which ranks markets based on the amount of available life science real estate. According to the Newmark report, investors in the Denver-Boulder life science market have transitioned from "as-is deals" to the funding of "lab-ready white box space."

Record-low lab vacancy rates in prime life-science markets across the country combined with a widespread shortage of talent among biotech companies has prompted growth in up-and-coming markets like Metro Denver.

In the second half of 2022, while many office users largely remained in work-from-home or hybrid mode, demand for commercial real estate and lab space from bioscience companies boomed in Metro Denver, especially along the U.S. Highway 36 corridor connecting Denver, Broomfield, and Boulder. All told, biotech-related development accounted for approximately 2.5 to 3 million square feet of construction underway or in the pipeline along the Boulder/Denver corridor as of the end of 2022. An uptick in new construction and conversions is expected to help counteract demand:

- » In 2022, BioMed Realty, a leading provider of real estate solutions to the life science and technology industries, bought roughly 1 million square feet of space in Flatirons Park for \$625 million – the largest real estate deal in Colorado history. At acquisition, about 25% of the park was life sciences, but the company’s goal is to convert up to 50% to life sciences over the coming years.
- » St. John Properties is adding significant square footage to Broomfield’s Simms Technology Park to help with the need for new life science space. The 600,000-square-foot campus will include buildings that can be easily utilized as lab space or research and development.
- » Lincoln Property Co. is developing a large office, research and development, and light-manufacturing campus in Interlocken with an eye towards biotech tenants. The project known as **CoRE – Colorado Research Exchange**, will be about 450,000 square feet spread across four buildings.
- » Mohr Capital LLC plans to build a four-building speculative campus in Broomfield’s Interlocken business park with 400,000 square feet of life science and industrial-flex space. The developer plans to break ground in the second quarter of 2024 with completion by the end of that year.
- » Conscience Bay Co. LLC is developing West Meadows, a 112,000-square-foot building that the company says represents a significant opportunity for a cutting-edge science and technology development.
- » Sterling Bay is transforming a Lafayette Corporate Campus office building formerly leased to Ball Corp. into a speculative flex space geared towards biotechnology tenants. The developer intends a roughly 50-50 split between office and laboratory uses

Innovative Technologies and Regulatory Approvals

- » Denver-based DaVita, a national provider of kidney dialysis services, and med-tech manufacturer Medtronic plan to form a new, independent kidney care-focused medical device company called NewCo. The company will focus on developing a broad suite of novel kidney care products and solutions, including future home-based products, to make different dialysis treatments more accessible to patients.
- » Protein analyzing biotechnology firm Somalogic Inc. partnered with genomics company Illumina Inc. to develop and bring to market a co-branded next-generation sequencing (NGS) platform to be used to better understand the human body.



Infrastructure for Bioscience Startups

- » **Fitzsimons Innovation Community**—Combines shared resources, talent, and expertise to support bioscience development and the delivery of life-saving products to patients. The community comprises 335,000 square feet of research development, lab, and educational space adjacent to the Anschutz Medical Campus.
 - » **Innosphere Ventures**—High-tech incubator in Denver, Boulder, & Fort Collins supporting entrepreneurs building high-growth companies in health innovation, life sciences, software & hardware, energy, and advanced materials.
 - » **Boomtown Accelerator**—Develops and adapts programs best suited for startups. The curriculum is customized to the needs of the individual startup, supporting and educating entrepreneurs where they need it the most.
 - » **CSU’s Research Innovation Center**—Hub for university scientists and students to partner with businesses to develop new products to treat and diagnose infectious diseases. Rentable space includes 21 different lab configurations totaling 7,500 sq. ft.
 - » **Catalyst**—Unites private enterprise (startups to Fortune 100), government, academic, and non-profit organizations with healthcare providers and payers to accelerate innovation.
 - » **Federal Laboratories**—Colorado is home to the second-largest concentrations of federal labs, totaling 33.
-
- » BioIntelliSense Inc., a Golden-based health technology company, launched the commercial availability of a new wearable device that allows for remote patient monitoring. The medical-grade BioButton Rechargeable device allows for continuous remote monitoring of more than 20 vital signs and biometrics and has a charge that can last up to 30 days.

BIOSCIENCE ECONOMIC PROFILE

9-County Rankings, 2022²

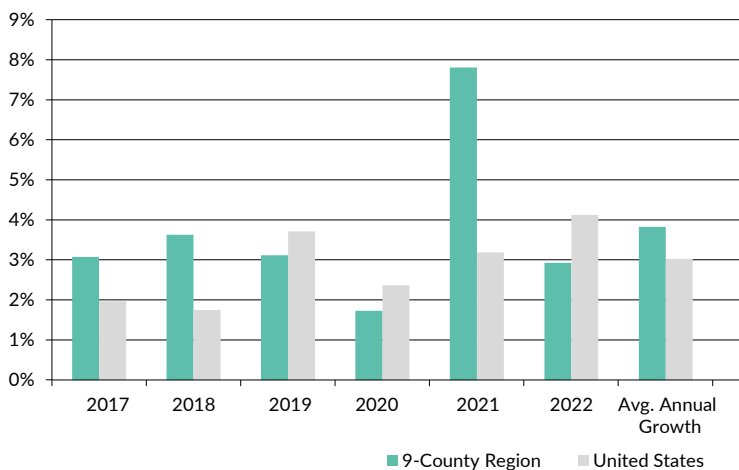
Bioscience Summary	
Bioscience Employment Rank	12th (unchanged from 2021)
Aviation Employment Concentration Rank	18th (down one position from 2021)

Bioscience Employment & Company Profile, 2022

	9-County Region	USA
Direct Employment, 2022	20,220	1,077,370
Number Of Direct Companies, 2022	950	44,840
One-Year Direct Employment Growth, 2021-2022	2.9%	4.1%
Five-Year Direct Employment Growth, 2017-2022	20.6%	16.1%
Avg. Annual Direct Employment Growth, 2017-2022	3.8%	3.0%
Direct Employment Concentration	1.0%	0.7%
% Of Companies With <10 Employees	74.9%	72.9%

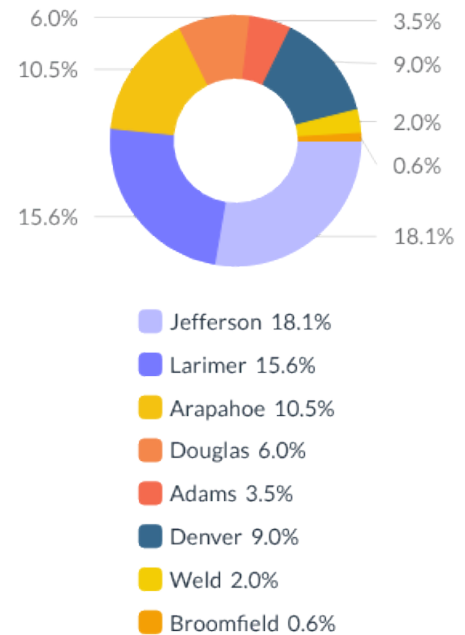
Sources: Dun & Bradstreet, Inc., Hoover's Online Database; Market Analysis Profile, 2017-2022; Development Research Partners.

Number of Employees Growth Rate

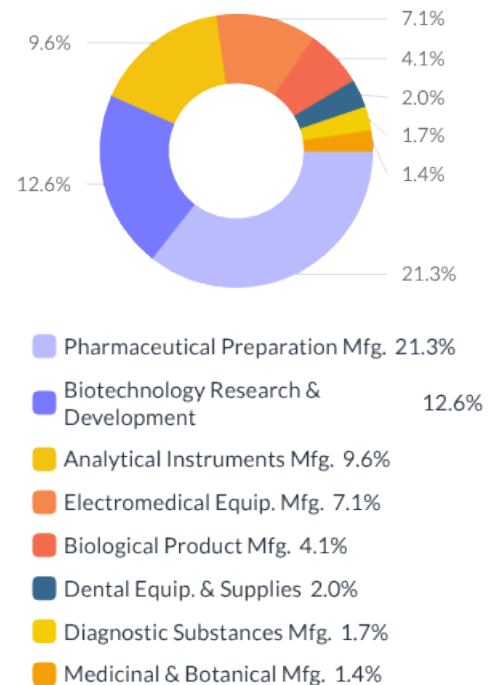


Source: Dun & Bradstreet, Inc., Hoover's Online Database; Market Analysis Profile, 2017-2022.
Source: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2003-2009.

Employment by County, 2022



Employment by Category



²Direct employment rank based on the number of employees in the industry cluster in a region. Employment concentration rank based on the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Rankings are for the 50 largest metropolitan statistical areas (MSAs). No multiplier effects are included. 1st = highest for both rankings.

BIOSCIENCE INDUSTRY SUBCLUSTERS

The Bioscience cluster is divided into two subclusters:(1) medical devices and diagnostics and (2) pharmaceuticals and biotechnology.

Medical Devices & Diagnostics includes companies that engineer, research, design, and manufacture medical equipment. The medical devices and diagnostics subcluster consists of eight, six-digit North American Industry Classification System (NAICS) codes.

Pharmaceuticals & Biotechnology companies manufacture, research, and develop pharmaceutical drugs. Companies in this subcluster utilize cellular and molecular biology and medicinal chemistry to develop and commercialize therapeutic medicines. The pharmaceuticals and biotechnology subcluster consists of four NAICS codes.

9-County Rankings, 2022³

Subcluster Rankings

Medical Devices & Diagnostics	
Medical Devices & Diagnostics Direct Employment Rank	10th (Unchanged From 2021)
Medical Devices & Diagnostics Direct Employment Concentration Rank	10th (Up Two Positions From 2021)
Pharmaceuticals & Biotechnology	
Pharmaceuticals & Biotechnology Direct Employment Rank	14th (Down One Position From 2021)
Pharmaceuticals & Biotechnology Direct Employment Concentration Rank	19th (Up Two Positions From 2021)

Bioscience Subclusters Employment & Company Profile, 2022

	Medical Devices & Diagnostics		Pharmaceuticals & Biotechnology	
	9-County Region	USA	9-County Region	USA
Direct Employment, 2022	12,260	525,530	7,960	551,840
Number Of Direct Companies, 2022	380	18,060	570	26,780
One-Year Direct Employment Growth, 2021-2022	1.6%	3.8%	5.0%	4.4%
Five-Year Direct Employment Growth, 2017-2022	6.6%	13.5%	51.3%	18.6%
Avg. Annual Direct Employment Growth, 2017-2022	1.3%	2.6%	8.6%	3.5%
Direct Employment Concentration	0.6%	0.4%	0.4%	0.4%
% Of Companies With <10 Employees	69.1%	70.2%	78.8%	74.7%

³Direct employment rank based on the number of employees in the industry cluster in a state. Employment concentration rank based on the direct cluster employment in a state expressed as a percent of total employment in all industries in the same state. Rankings are for the 50 states. No multiplier effects are included. 1st = highest for both rankings.

INDUSTRY INFRASTRUCTURE SUPPORT



CU Bioscience Centers Include:

- » BioFrontiers Institute
- » Biomedical Informatics & Personalized Medicine
- » Cancer Center
- » Colorado Clinical & Translational Sciences Institute
- » Gates Manufacturing Facility
- » Webb-Waring Center





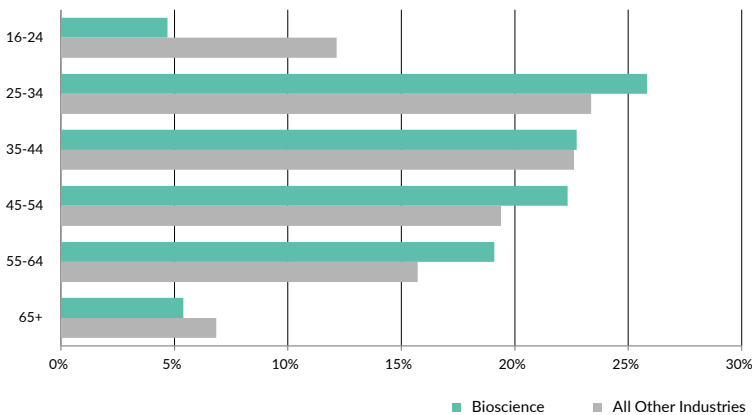
BIOSCIENCE WORKFORCE PROFILE

- » Denver ranked 10th for life sciences talent in the 2022 Life Sciences Real Estate Outlook. (Jones Lang LaSalle Inc.)
- » The region is home to four top-ranked bioscience programs (CU Boulder, CSU, University of Denver, and CU Denver) and 1,747 life science graduates within a 60-mile radius of Denver. (CBRE, 2022)
- » Metro Denver ranked among the top 10 metro areas with the highest employment levels of biological technicians in the most recent U.S. Bureau of Labor Statistics occupation data.
- » Employment in the pharmaceuticals and biotechnology subcluster expanded for seven-consecutive years in 2022, adding nearly 3,000 employees over the past five years.
- » Metro Denver ranked #4 among the strongest areas in the nation for science, technology, engineering, and mathematics (STEM) job growth in the 2022 STEM Job Growth Index. (RCLCO, 2022; CapRidge Partners, 2022)

Age Distribution

- » More than 1 in 4 workers in the Bioscience cluster were between the ages of 25 and 34 years old.
- » The age distribution of workers in the region's Bioscience cluster is concentrated between the ages of 25 and 54 years old (70.8%), compared with the age distribution of all industries across the nine-county region (65.3%).

Metro Denver & Northern Colorado's Distribution of Employment by Age



Wages

- » The 2021 average annual salary for workers in the Bioscience cluster was \$117,220 in the nine-county region, compared with the national average of \$130,960.
- » The average starting salary for workers in the Bioscience cluster was \$52,600 in the region, compared with \$43,070 across all industries.
- » Total payroll reached nearly \$2.3 billion in 2021.

Occupation and Salary Profile

The Occupation & Salary Profile below includes the 10 largest cluster occupations. It details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.



METRO DENVER & NORTHERN COLORADO BIOSCIENCE OCCUPATION & SALARY PROFILE, 2022

10 Largest Bioscience Occupations in Metro Denver and Northern Colorado	Total Working Across All Industries (2022)	Number of Available Applicants (2022)	Number of Graduates (2021)	Median Salary	10th Percentile Salary	25th Percentile Salary	75th Percentile Salary	90th Percentile Salary
Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	4,367	54	55	\$38,144	\$29,652	\$34,174	\$45,986	\$56,795
Miscellaneous Assemblers and Fabricators	8,757	225	0	\$36,558	\$28,754	\$30,334	\$43,719	\$49,704
Software Developers	37,179	260	3228	\$119,901	\$76,977	\$97,231	\$140,252	\$167,728
Chemists	2,054	39	600	\$96,208	\$46,996	\$61,761	\$123,084	\$134,140
Packaging and Filling Machine Operators and Tenders	4,244	67	0	\$38,033	\$28,898	\$30,607	\$52,558	\$59,448
First-Line Supervisors of Production and Operating Workers	6,479	90	141	\$64,562	\$40,908	\$49,741	\$84,447	\$103,644
Industrial Engineers	3,555	23	181	\$98,723	\$63,487	\$77,568	\$125,124	\$148,142
Inspectors, Testers, Sorters, Samplers, and Weighers	4,846	24	64	\$46,519	\$28,999	\$37,059	\$61,093	\$77,558
Dental Laboratory Technicians	505	1	0	\$40,660	\$29,774	\$34,601	\$54,921	\$65,034
Biological Technicians	2,844	26	1,178	\$49,144	\$38,605	\$40,403	\$63,919	\$80,097

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado's workforce development system's statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - Lightcast 2022.4 Class of Worker.



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