

2022 Greater Philadelphia Cell and Gene Therapy Workforce Update

Executive Summary

Introduction

In 2019, the CEO Council for Growth (“CEO Council”), University City Science Center (“Science Center”), and University City District’s West Philadelphia Skills Initiative convened a partnership to leverage their resources and networks on an initiative to support and grow the Greater Philadelphia region’s cell and gene therapy sector. Since the release of that report, the cell and gene therapy industry in Greater Philadelphia has continued to grow and develop, even while the COVID-19 pandemic was not only dramatically impacting people’s health and welfare, but also the health care industry, global economies, and the nature and makeup of the workforce across all industries.

In early 2022, two of the original partners, the CEO Council and the Science Center, engaged Econsult Solutions, Inc. (ESI) to refresh and update the analysis done in 2019 to assess changes in the industry, and to learn more about the future workforce needs for Greater Philadelphia’s growing cell and gene therapy industry. ESI used analysis of LinkedIn data, job postings and insights from regional leaders to determine both the labor market supply and demand, respectively, for the cell and gene therapy sector in Greater Philadelphia.

Key Findings

Greater Philadelphia’s cell and gene therapy sector is growing and maturing.

- Data and industry perspectives point to the region maintaining its position as an R&D hub and increasingly becoming a commercialization and manufacturing center.
- There has been strong growth in existing companies, and we are seeing new entries into the marketplace. The real estate market is booming. More professionals are listing cell and gene therapy skills in their LinkedIn profiles.
- There is significant economic opportunity for our region, but it is a competitive landscape with top regions growing at the same pace in attracting and retaining skilled talent.

Future growth is likely, but important steps to build future workforce capacity need to be taken.

- The key to future growth will be developing a local workforce, at all levels, that can meet the needs of companies.
- Companies, educators, and training partners must collaborate to build career pathways for non-traditional candidates, particularly in the manufacturing space.
- The creation of new programs that bring together companies and training organizations represents a key opportunity for companies to hire trained talent at scale.

Continued strong employment growth is expected—and is exceeding 2019 expectations.

- Employment at cell and gene therapy (CGT) companies and contract manufacturing organizations (CMO) grew by 80% from 2019 to 2022, to 3,600 employees, as measured by LinkedIn profiles. The number of biopharma employees listing cell and gene therapy-related skills grew by more than 200% from 2019 to 2022.
- Industry experts expect similar levels of growth for the next five years, especially if talent and funding barriers are mitigated.

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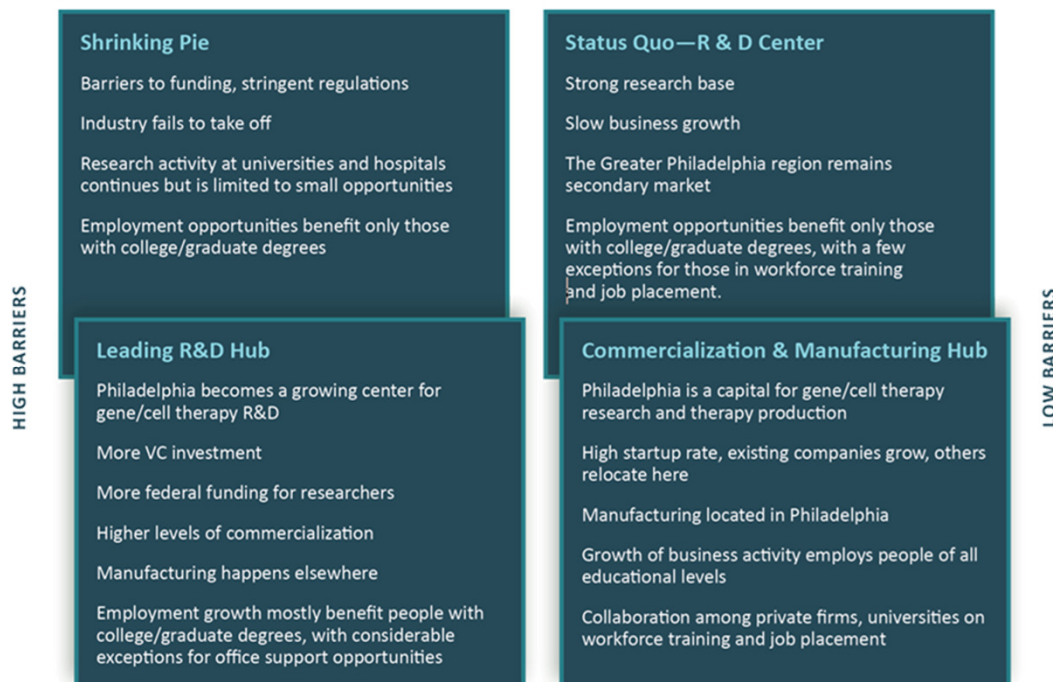
Leading R&D Hub Scenario

- Greater Philadelphia is likely to maintain its current role as a Leading R&D Hub, based on a continued focus on scientific, laboratory, and analytical roles. It is expected that manufacturing roles will be focused in CMOs and more limited manufacturing employment growth will occur in CGT and biopharma.
- With industry experts projecting employment growth of between 25% and 50% over the next three years, we would expect total employment at CGT companies and CMOs to be between 4,500 and 5,400 employees, with increasing shares of employees not requiring bachelor's degrees.

Commercialization & Manufacturing Hub Scenario

- Local experts believe we are moving toward the Commercialization & Manufacturing Hub Scenario based on surveys and roundtable feedback, with an accompanying increased need for manufacturing and quality assurance roles.
- If the region can meet this goal, growth of 75% would result in 6,300 jobs at CGT companies and CMOs by 2025, with up to 25% of those jobs being in manufacturing roles requiring fewer educational requirements.
- Lack of available talent could slow movement to this scenario. There has been a lot of growth already, but there are expectations of more growth if funding and talent barriers are mitigated. Companies like Spark Therapeutics and Discovery Labs, as well as contract manufacturers, demonstrate the potential for workforce growth. However, if the region doesn't keep up with employment needs at all levels, it may be difficult to reach those expectations.

LIMITED, SPECIALIZED TALENT POOL

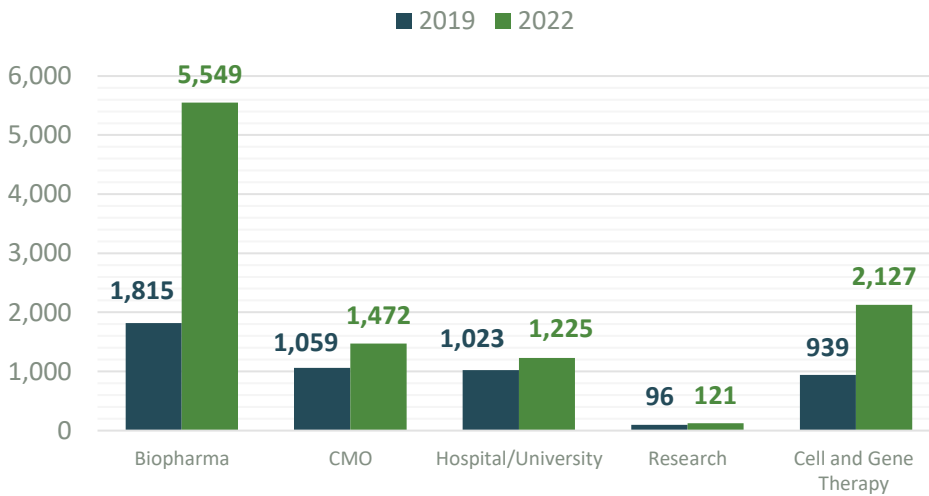


Source: Econsult Solutions, Inc. (2019)

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Employment and Growth Projections

Total Employees by Industry



Source: LinkedIn Talent Insights Company Report; CEO Council for Growth; Econsult Solutions, Inc.

Strong CGT employment growth has been seen across the region since 2019.

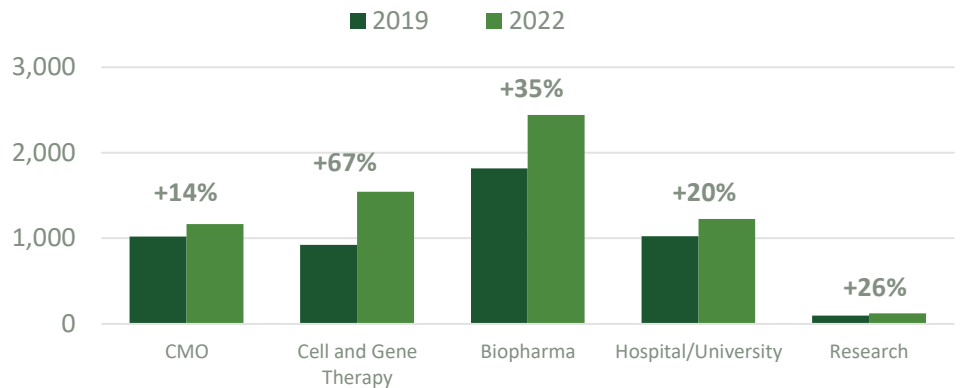
As measured through LinkedIn Talent Insights analysis of current regional employees, the Greater Philadelphia region has seen strong growth in cell and gene therapy employment.

- Regional employment for cell and gene therapy companies has more than doubled since 2019 (up 127%).
- Employees at contract manufacturing organizations (CMOs) have grown by nearly 40% since 2019.
- The number of employees at regional biopharma companies claiming cell and gene therapy-related skills has grown by over 200%.

Existing company growth has been crucial.

While much of the growth in regional employment since 2019 has come from new companies or divisions focused on CGT, examination of companies that had LinkedIn employment data in both 2019 and 2022 shows strong growth as well, with CGT companies increasing employment by 67 percent over this time period.

Employment at Select Companies and with Specific Skillsets, 2019 vs 2022



Source: LinkedIn Talent Insights Company Report; CEO Council for Growth; Econsult Solutions, Inc.

Leading R&D Hub Scenario

- Maintain current role as a leading R&D hub, based on continued focus on scientific, laboratory, and analytical roles, manufacturing roles focused in CMOs, more limited manufacturing growth in CGT and biopharma.
- Projecting employment growth of between 25% and 50% over the next three years, Greater Philadelphia can expect total employment at CMOs and CGT companies to be between 4,500 and 5,400 employees, with increasing shares of employees not requiring bachelor's degrees.

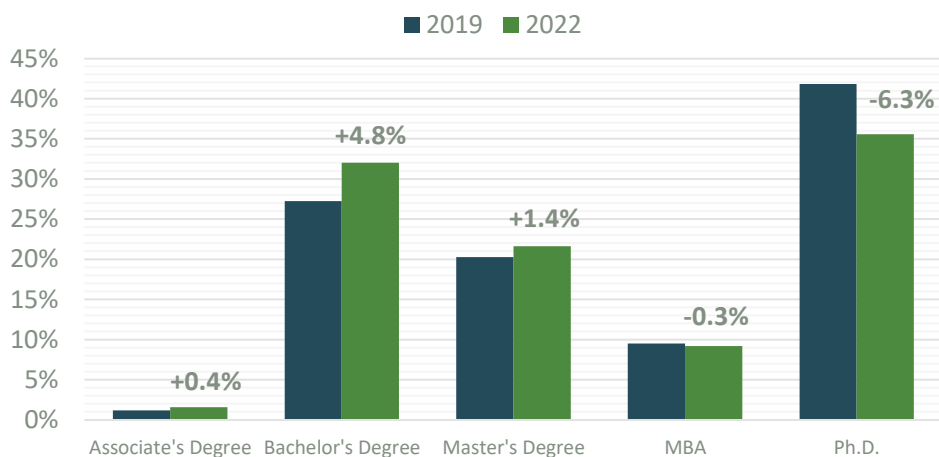
Commercialization & Manufacturing Hub Scenario

- Moving toward a commercialization & manufacturing hub scenario based on surveys and roundtables feedback, with an accompanying increased need for aseptic technician and quality assurance roles.
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Shifts in Education and Skills Requirements

Educational Attainment Shares



Source: LinkedIn Talent Insights Company Reports; Econsult Solutions, Inc.

Share of employees with master's degrees or lower increased since 2019.

As the industry has grown, the educational attainment levels within the CGT workforce are shifting.

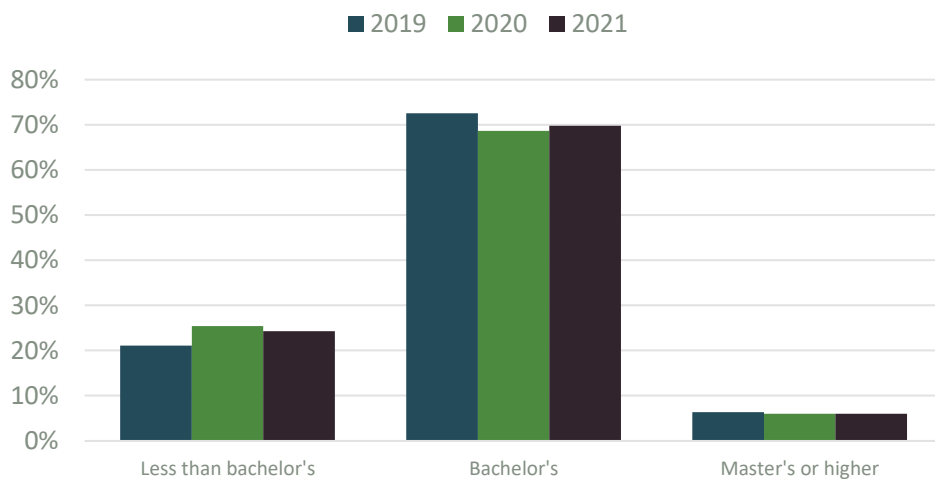
- Employees with bachelor's degrees make up a larger share of CGT employment in 2022 than in 2019, with the share increasing by nearly 5%.
- As the industry matures, existing companies grow, and more manufacturing of therapies is occurring, the share of employees with advanced degrees has fallen.

Contract manufacturing organizations (CMOs) currently present the largest opportunity for early entry into the life sciences industry with nearly a quarter (24 percent) of job postings requiring less than a bachelor's degree in 2021.

Conversely, the biopharma and cell and gene therapy industries in the Greater Philadelphia region required more skilled labor when compared to their CMO counterparts.

We would expect this to change over time as CGT companies grow and begin to operate their own manufacturing centers, thus changing the degree requirements for key positions and openings.

CMO Degree Requirements



Source: Burning Glass; Econsult Solutions, Inc.

Fastest-growing Skills within Greater Philadelphia's CGT, CMO and Biopharma Companies

Within the Greater Philadelphia region, the fastest-growing skills for professionals working or looking for work in the cell and gene therapy sectors are "analytical skills" and "biology"; ranked first and second place, respectively.

Compared to 2019, there is much similarity in terms of the skills recognized, apart from troubleshooting and data analysis, which are no longer ranked among the top skills.

New skills that have emerged in the top-five bracket in 2022 are finance and gel electrophoresis. The emergence of the finance skill in particular showcases the expansion of the industry by highlighting the need for talent with more varied skillsets, not exclusive to those pertinent to the life sciences industry, to take on other avenues of company operations.

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Competition for Talent

Top Regions Seeing Steady Growth

The top regions in the U.S. for cell and gene therapy, inclusive of Greater Philadelphia, continue to exhibit steady growth. Although the Greater Philadelphia region was positioned toward the lower end of over-the-year-growth in 2021 when compared to the other sample regions, it is important to note that Greater Philadelphia is keeping pace in terms of producing talent that will continue to propel the CGT sector forward.

Further, with its agglomeration of high-caliber universities and hospitals, many of which already work in partnership with one another, Greater Philadelphia is poised to continue producing talent to feed industry needs. The region has more professionals within the CGT sectors than the San Diego Metro Area and the Raleigh-Durham-Chapel Hill Area, but it will be important to track growth trends in these top regions and potentially new emerging markets.

Recruiting and Retaining Talent

Compared to the other sample regions in this analysis, Greater Philadelphia remained relatively stable in terms of net talent loss and gain. However, there was a slight change in the ratio of talent gained to talent lost in relation to 2019, with the 2019 ratio being 1.03 compared to .91 in 2022, meaning that slightly more talent was lost to other top regions from 2021 to 2022, as opposed to 2019 when the region gained slightly more than it lost.

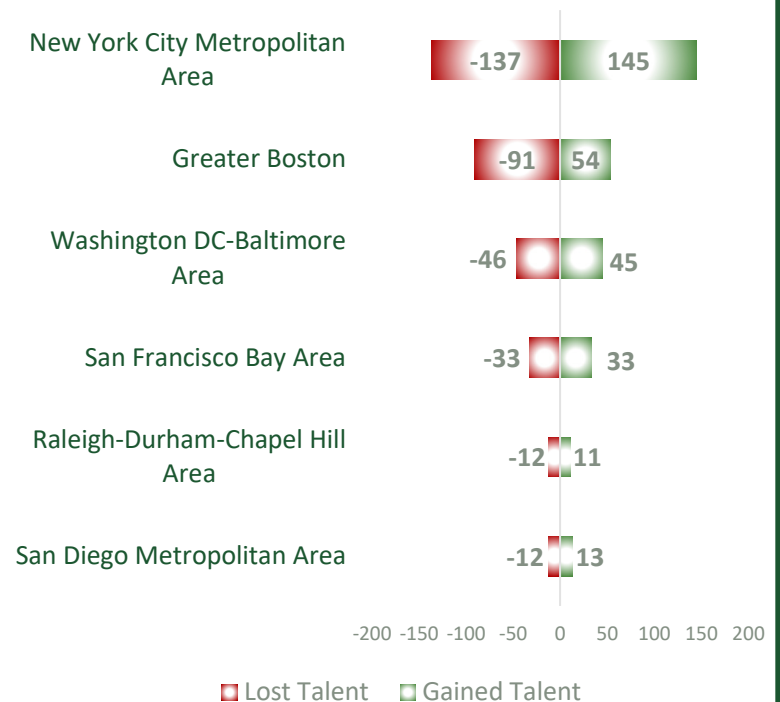
Looking at how Greater Philadelphia is faring versus other regional top markets, the region remained relatively even in terms of net talent flows with all of the peers except for the Boston region, which continues to be a magnet for talent in the sector. As the industry grows in Greater Philadelphia, it will be important to track these net talent flows as the industry matures and competes on a national level for high-level talent.

2020 to 2021 growth in professionals with CGT Skills, PHL vs. Top Regions

	Professionals	Over the year growth
Greater Boston	83,252	+2.4%
New York City Metro Area	81,066	+2.3%
San Francisco Bay Area	78,147	+2.0%
Washington DC-Baltimore Area	44,395	+2.4%
Greater Philadelphia	36,865	+2.0%
Raleigh-Durham-Chapel Hill Area	25,478	+2.2%
San Diego Metropolitan Area	24,064	+2.2%

LinkedIn Talent Insights Talent Pool Reports; Econsult Solutions, Inc.

Greater Philadelphia Talent Loss and Gain Among Top Regions 2021-2022



Source: LinkedIn Talent Insights Talent Pool Reports; Econsult Solutions, Inc.