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MIDYEAR 2023

# The National Life Science Market Overview



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# Market Observations

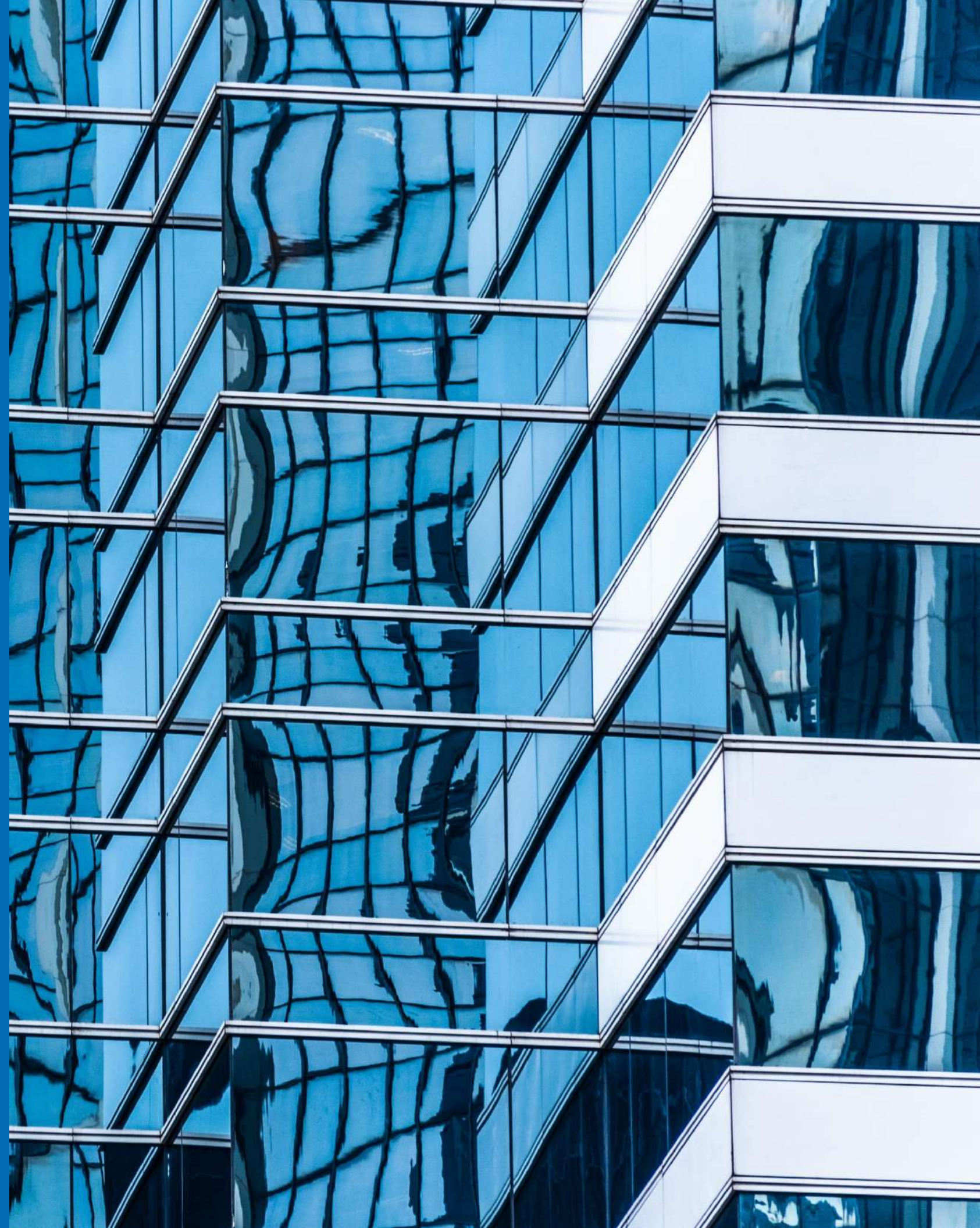
- U.S. life science real estate fundamentals waver as the market continues to adjust. Vacancies and availabilities continued to climb throughout many of the nation's top life science clusters, reaching cyclical highs in top markets such as Boston, the Bay Area, and San Diego. These three markets also recorded a combined 542,000 SF of negative net absorption during the first half of 2023, while new deliveries have accelerated.
- Job growth remains positive, but year-over-year job growth slowed to 2.1% year-over-year as of June and just 1.3% since year-end 2022. This represents the slowest annual growth rate since the height of the pandemic in 2020. Continued tumult within the sector has resulted in a growing number of strategic layoffs among biotech companies throughout the U.S. and Europe. The rate of employment growth will likely slow further in the coming quarters as a result.
- Venture capital funding for U.S. life science companies inched up during the second quarter of 2023, bringing total capital invested to \$11.7 billion year-to-date. Despite representing one of the lowest quarters since peaking in 2020 and 2021, current life science venture capital funding is in line with 2019 quarterly totals. If this pace of funding continues through the remainder of the year, 2023 will far outpace annual historic averages.
- Supply-side fundamentals remain robust, with nearly 31.0 million SF of purpose-built laboratory space currently under construction. The Boston metro area is leading the charge and accounts for 37.3% of this total, followed by the Bay Area at 26.5% of square feet underway. There are also several million SF of active laboratory conversion projects under construction throughout the U.S., driving further inventory expansion in the life science sector. The continued supply wave will ultimately keep upward pressure on laboratory vacancies in the near term.
- Landlords have benefited from strong fundamentals and lease rates for laboratory space have continued to climb throughout midyear 2023. Quarterly rent growth within the largest life science real estate markets of Boston, the Bay Area and San Diego has slowed, increasing by just 0.6% during the second quarter of 2023.
- The lack of investment opportunities continues to weigh on investment sale volumes. Activity picked up slightly during the second quarter of 2023, and year-to-date investment sale volumes for life science-related assets in the top three clusters reached \$2.8 billion. Select owners have begun to divest non-core assets, creating some buying opportunities. Despite lower sale volumes and rising cap rates, life science assets have outperformed all other property types since 2008. Private market returns are second only to industrial over the last decade.

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MIDYEAR 2023 U.S. LIFE SCIENCE MARKET OVERVIEW

# Demand Drivers



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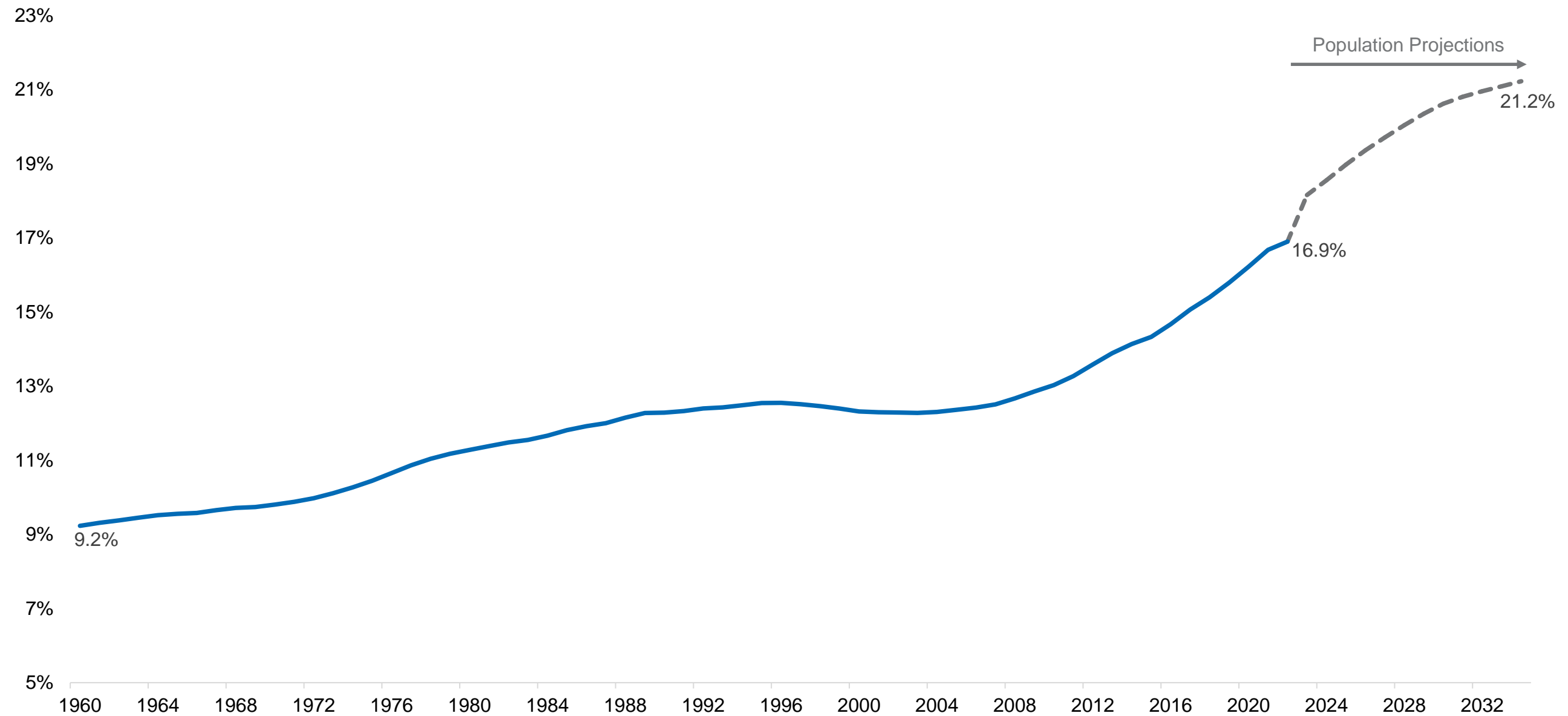
# Life Science Sector Overview

- Rapid growth within the U.S. life science industry over the last several years has resulted in a very healthy development pipeline, outsized rent growth, historically low vacancies and record levels of investment. More capital, both public and private, flowed into the life science sector from 2020 to 2021 than at any point in U.S. history. The heady days of the pandemic have subsided, but long-term growth drivers remain decidedly positive.
- Characterized by continuous research and development and technological advances, the life science sector plays a critical role in addressing the healthcare needs of an aging global population, developing new drug therapies and contributing to public health initiatives. Life science-related real estate is required to accommodate the research, development, manufacturing, and commercialization efforts of biotech companies as well as support growth within the industry. Research laboratories, pilot plant, and cGMP facilities, incubator and innovation spaces, animal facilities and office space are all vital for operations.
- The U.S. life science industry also maintains a key role in generating new jobs and growing the economy. In 2022 alone, more than 100,000 biotech jobs were added to national payrolls and historic growth has far outpaced job gains for all U.S. occupations. Another 34,000 jobs were added to U.S. payrolls during the first half of 2023 as well. According to the Biotech Innovation Organization and the Council of State Bioscience Associations, the biotech sector contributed \$2.9 trillion to the U.S. economy in 2021.
- As this sector continues to expand and mature, commercial real estate will follow. Accordingly, accelerated growth patterns associated with an emerging sector like life science are expected to normalize.

# The Graying of America: U.S. Population is Aging

As of 2022, the percentage of U.S. residents aged 65 and older rose to 16.9%. Much of this growth can be attributed to the aging Baby Boomers, which has historically been the nation's largest generation. Population projections point to accelerated growth among this age cohort. This aging demographic will remain a driving force behind the growing emphasis on healthcare and life sciences.

## Percent of U.S. Population Aged 65 and Above

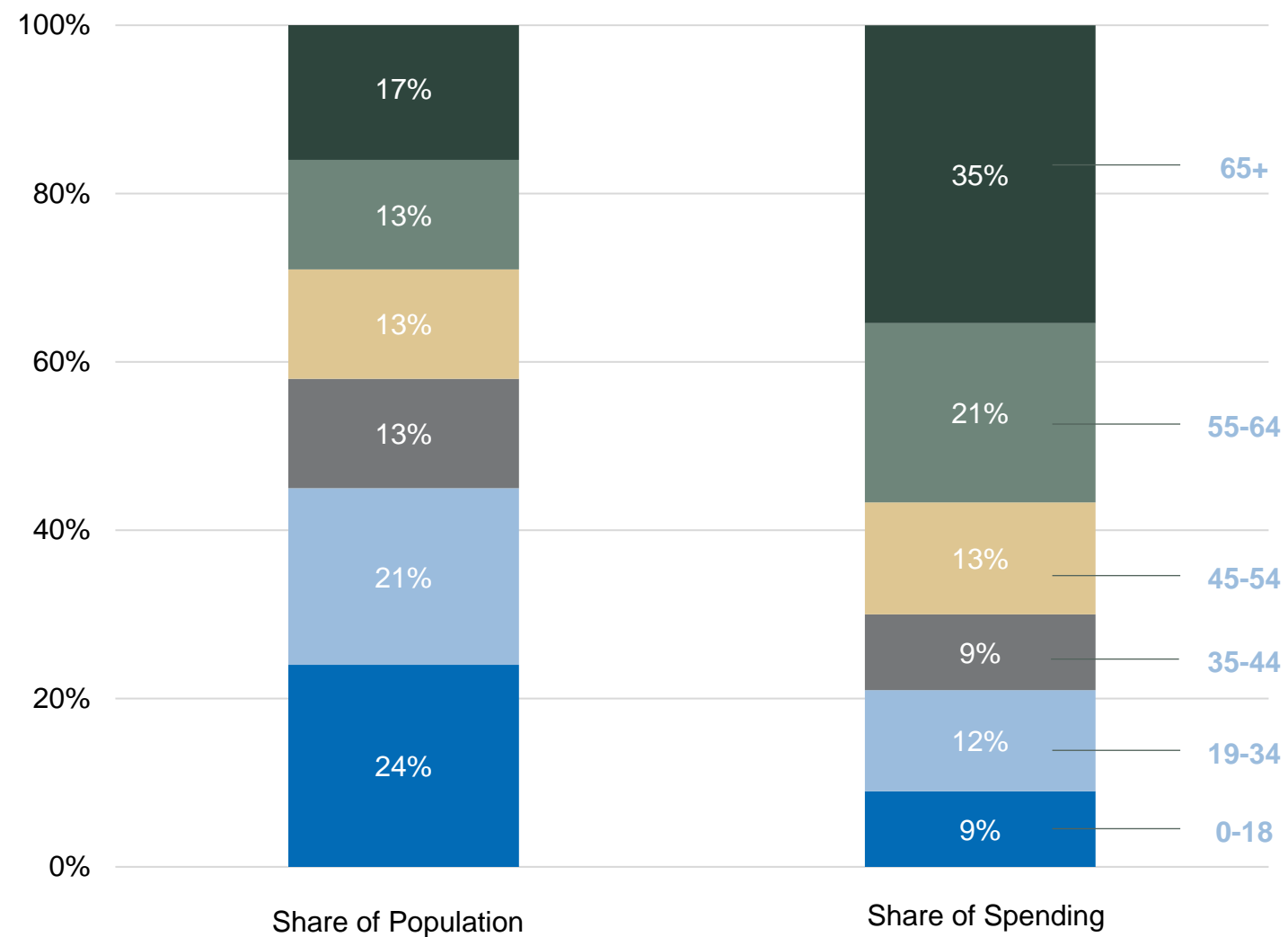


Source: The United Nations Population Division's World Population Prospects, JobsEQ, Newmark Research

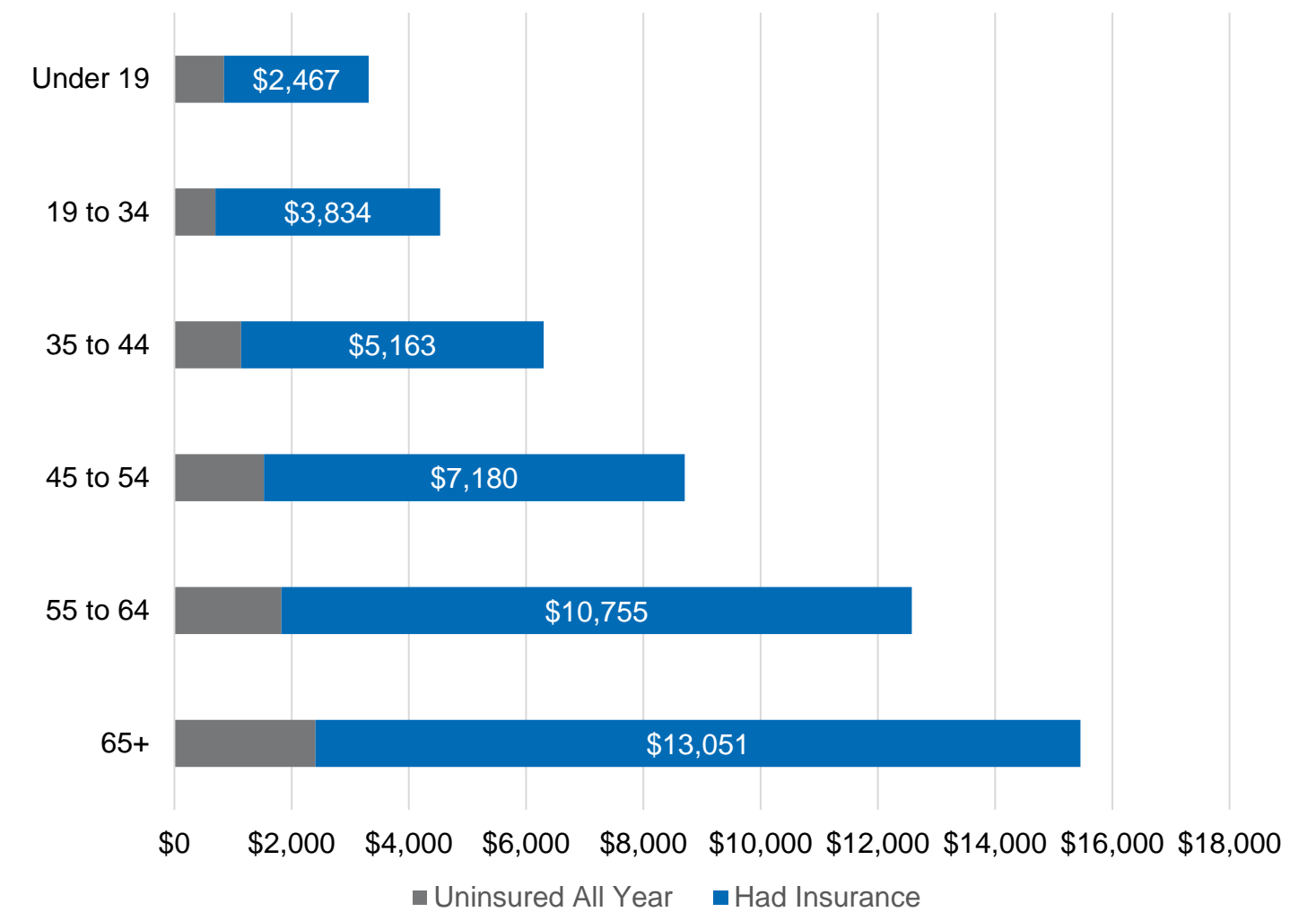
# The Price of Aging: Older Cohorts Maintain Higher Healthcare Costs

Not surprisingly, those 65 years and older account for the greatest share of total healthcare spending. On a per-capita basis, the oldest insured age cohort spends 21.3% more than those aged 55 to 64 years old. As the U.S. population continues to age, healthcare spending will become increasingly more impactful, which bodes well for the future of the life science sector.

Share of Total Health Spending by Age Group, 2019



Average Total Health Spending by Insurance Status, 2019

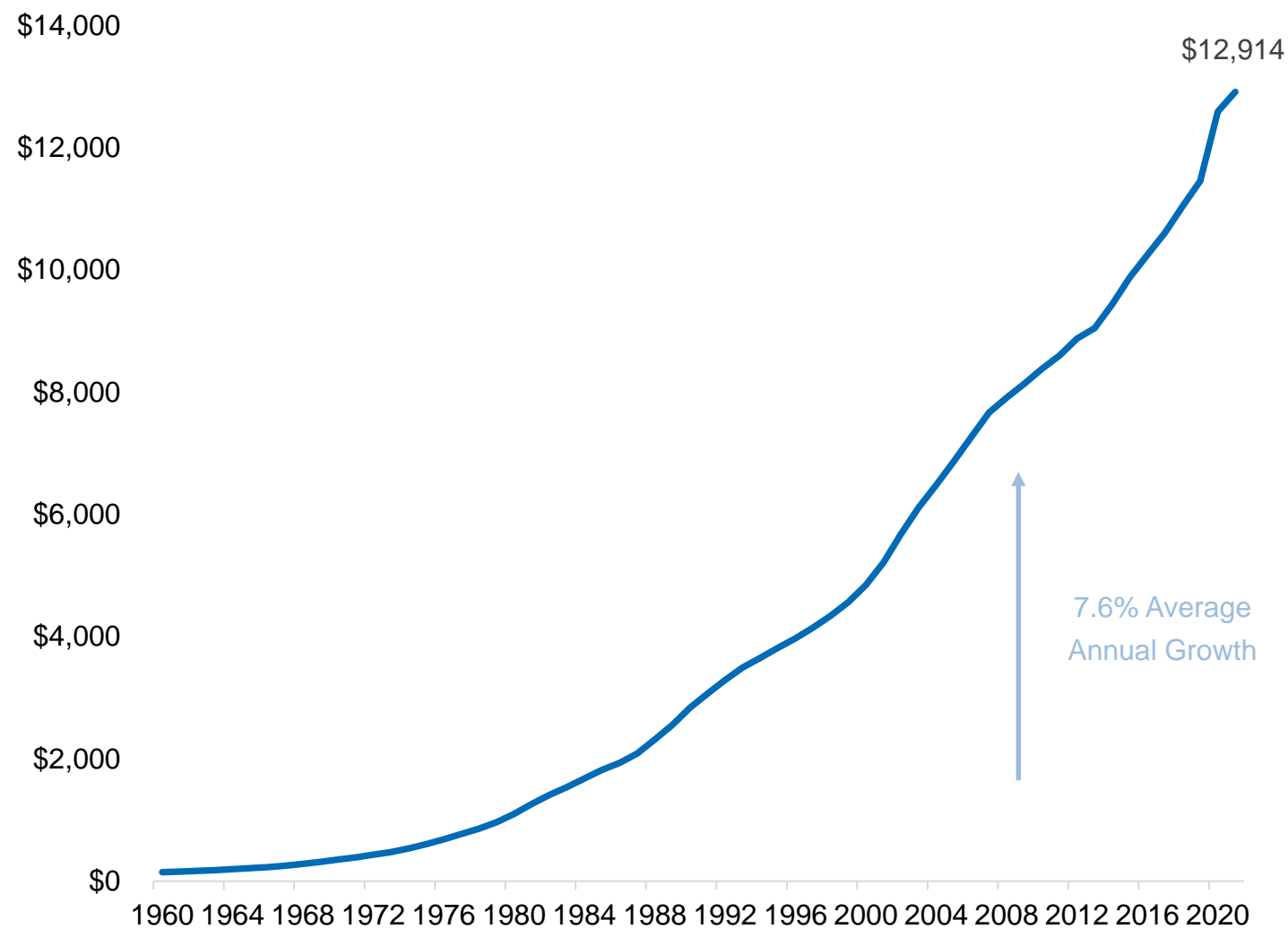


Source: KFF Analysis of Medical Expenditure Panel Survey 2019 data, Newmark Research

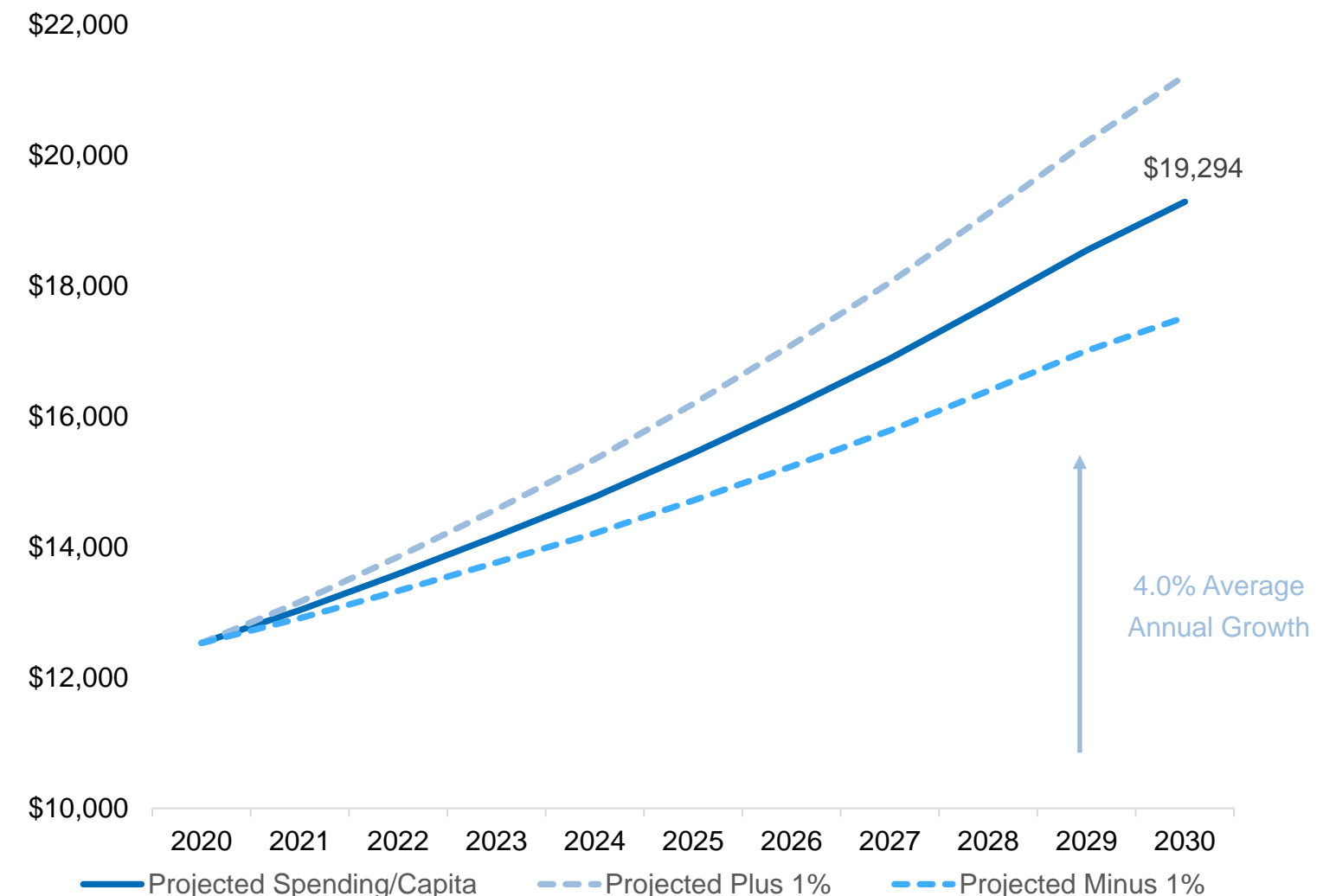
# Healthcare Spending Per Capita Has Reached a 60-Year High and is Rising

As the population ages, a greater emphasis on healthcare will help drive life science demand. Healthcare spending has increased an average of 7.6% annually since 1960, with inflation driving more recent trends. As a result, per-capita spending in the base case scenario is projected to increase by nearly 50% by 2030 or 4.0% per year. Alternatively, an additional 1.0% per year in healthcare spending per capita will result in an overall increase of 64.3% through 2030. Given historical trends, projected spending could be higher than expected.

**U.S. Per Capita Health Expenditures (All Spending Types by All Sources)**



**Scenarios of Projected Annual Change in U.S. Per Capita Health Spending**



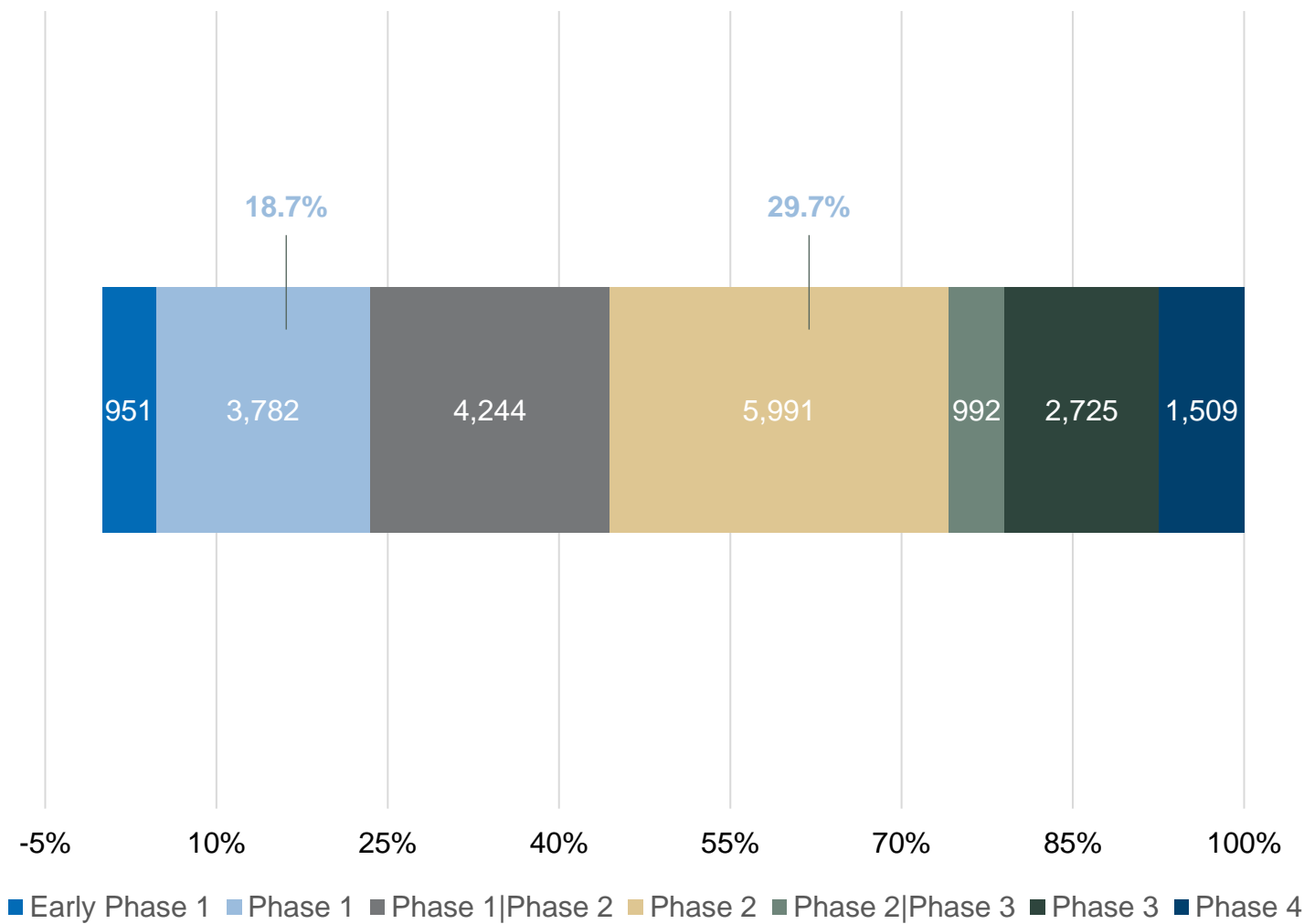
Source: KFF Analysis of Medical Expenditure Panel Survey 2019 data, KFF Analysis of NHEA, National Health Spending Explorer, Newmark Research



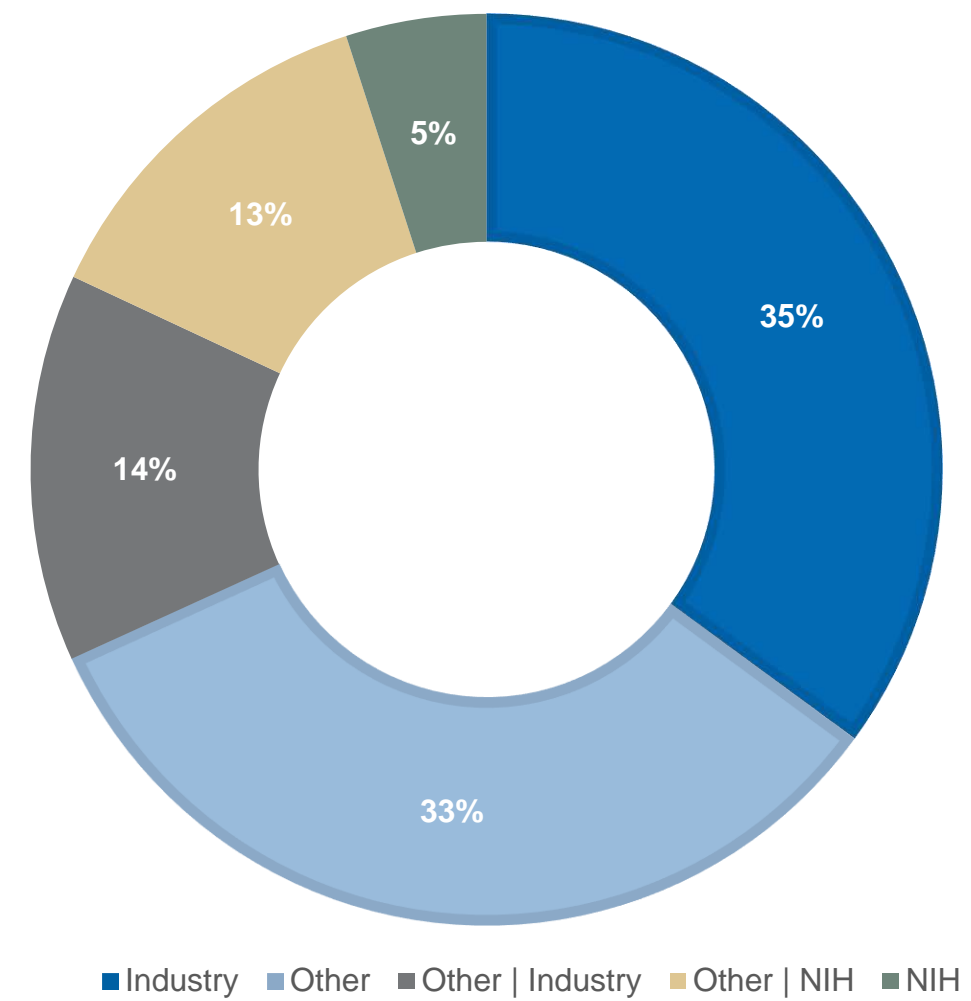
# Growth in Active Clinical Trials Supports Future Lab Demand

Over the last 20 years, U.S. clinical trials have grown exponentially and the number of registered studies in the U.S. reached an all-time high in early 2023. Life science companies with drugs in any phase of trial could experience greater space needs, but later-stage studies tend to be larger. Clinical trials receive funding from several sources, with private investment and the National Institutes of Health (NIH) representing major contributors.

Clinical Trials by Phase



Clinical Trials by Funding Source



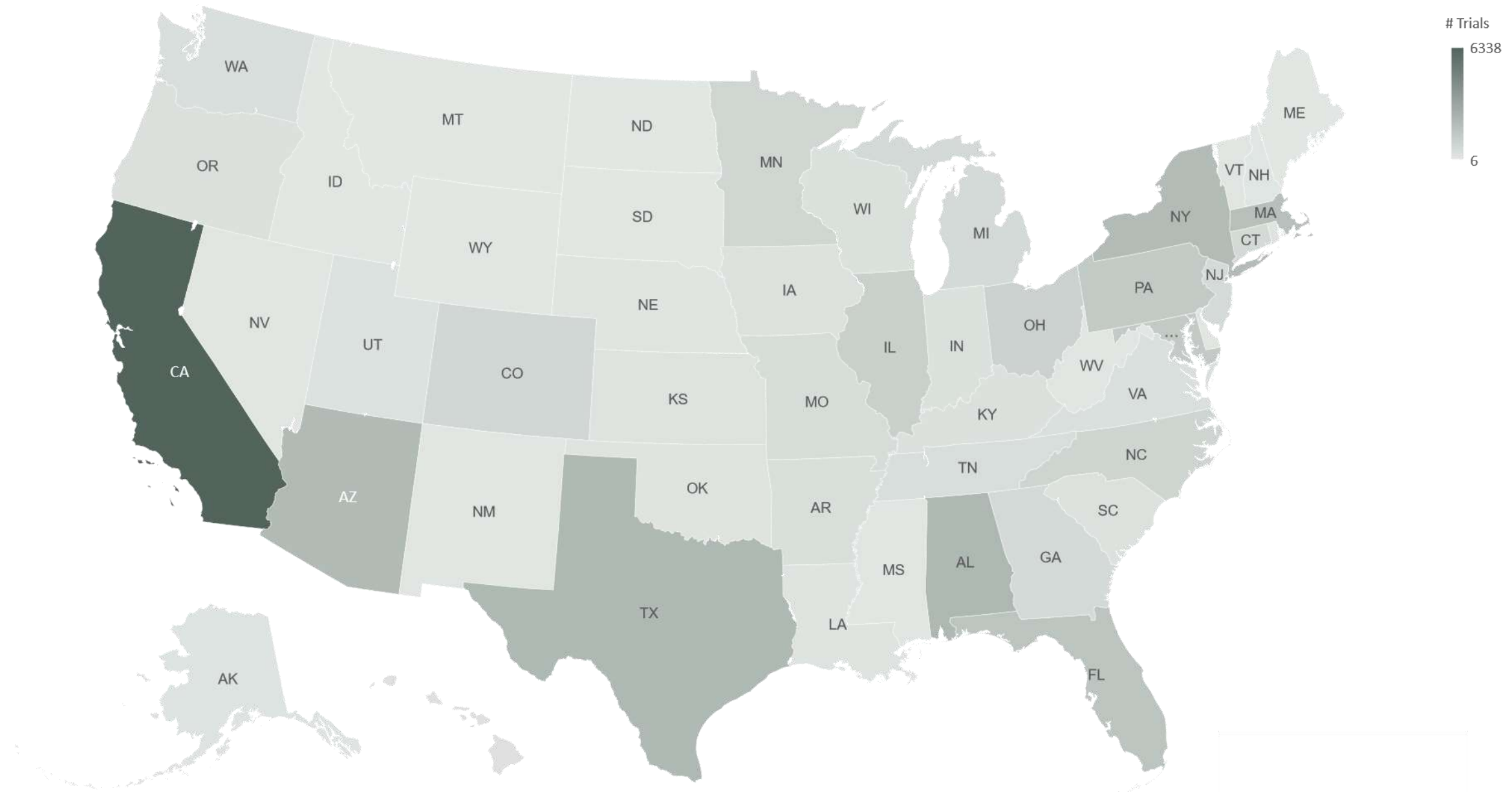
Source: ClinicalTrials.gov, Newmark Research

Note: Includes interventional clinical trials with a recruitment status of not yet recruiting, recruiting, enrolling by invitation, and active (not recruiting).

# Clinical Trials Follow the People and Universities

Trials also need participants. Looking at the number of active interventional clinical trials within the U.S., many states with large metro areas have risen to the top. Access to funding and top research universities also plays into where clinical trials are concentrated. Alabama is among the top states for clinical trials, given the number of active trials being run by the state's university system. Roughly 43.0% of clinical trials are associated with an educational institution and tend to be co-located with top research hospitals as well.

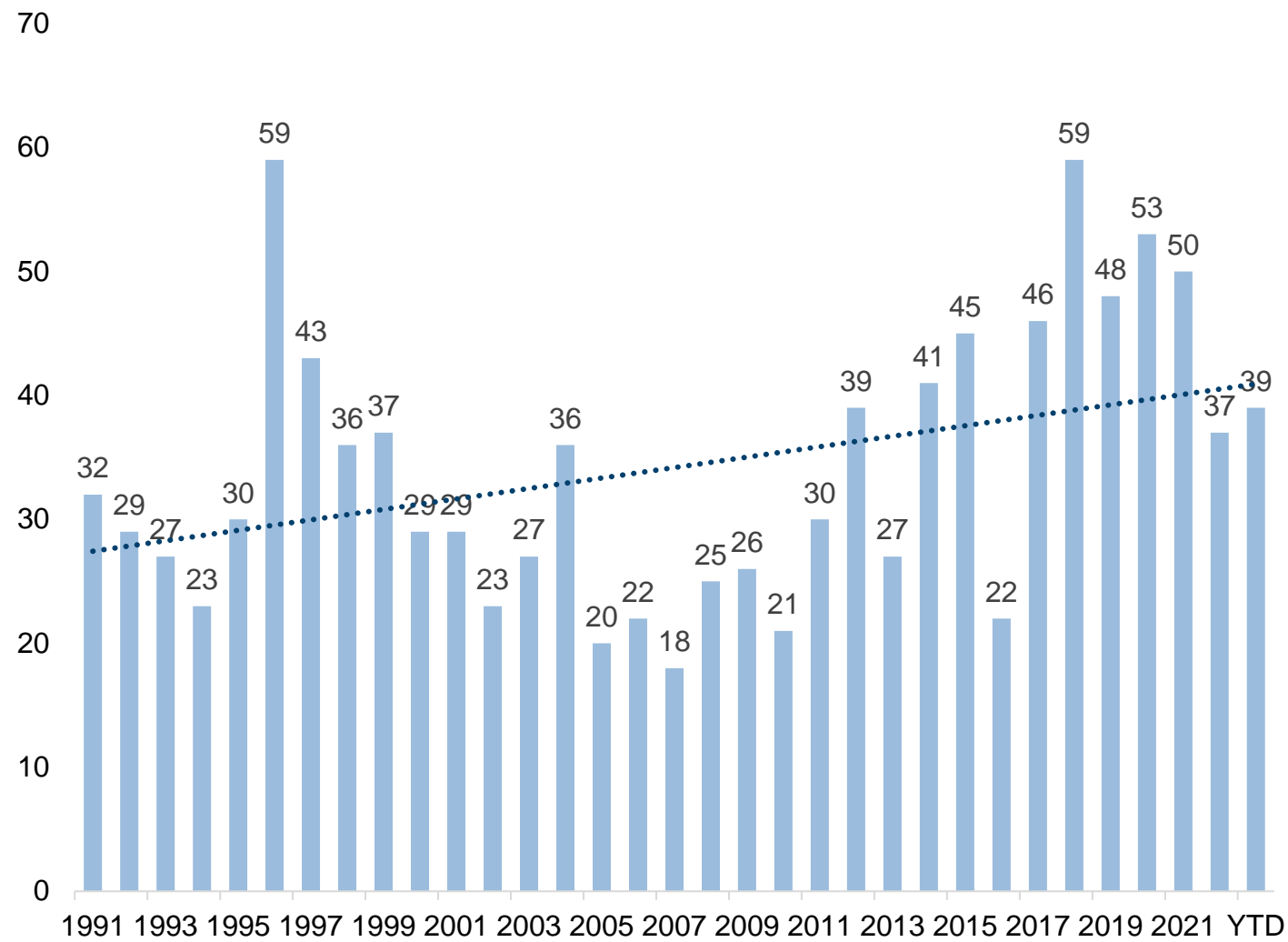
## Geographic Concentration of Clinical Trials



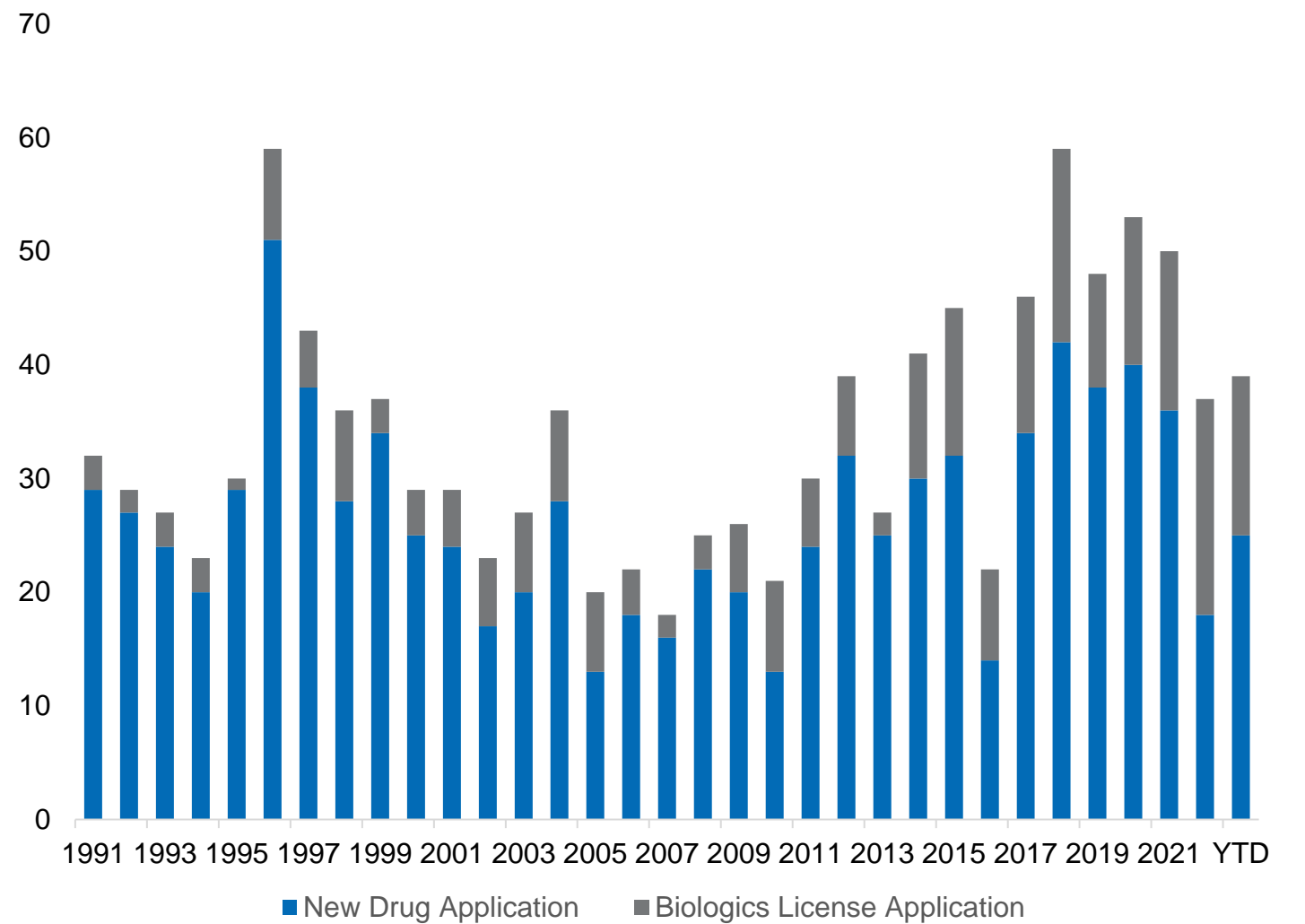
# FDA Approvals are Generally Trending Upward

While Operation Warp Speed fast-tracked several therapies during the pandemic, FDA approvals have been on an upward trajectory over the last 40 years. As new drugs and treatments move through the pipeline, biotech companies will ultimately need more research and development and manufacturing space. However, according to PhRMA, only 12.0% of new molecular entities that enter clinical trials ultimately receive FDA approval.

FDA Annual New Drug Approvals



FDA Annual New Drug Approval by Application Type

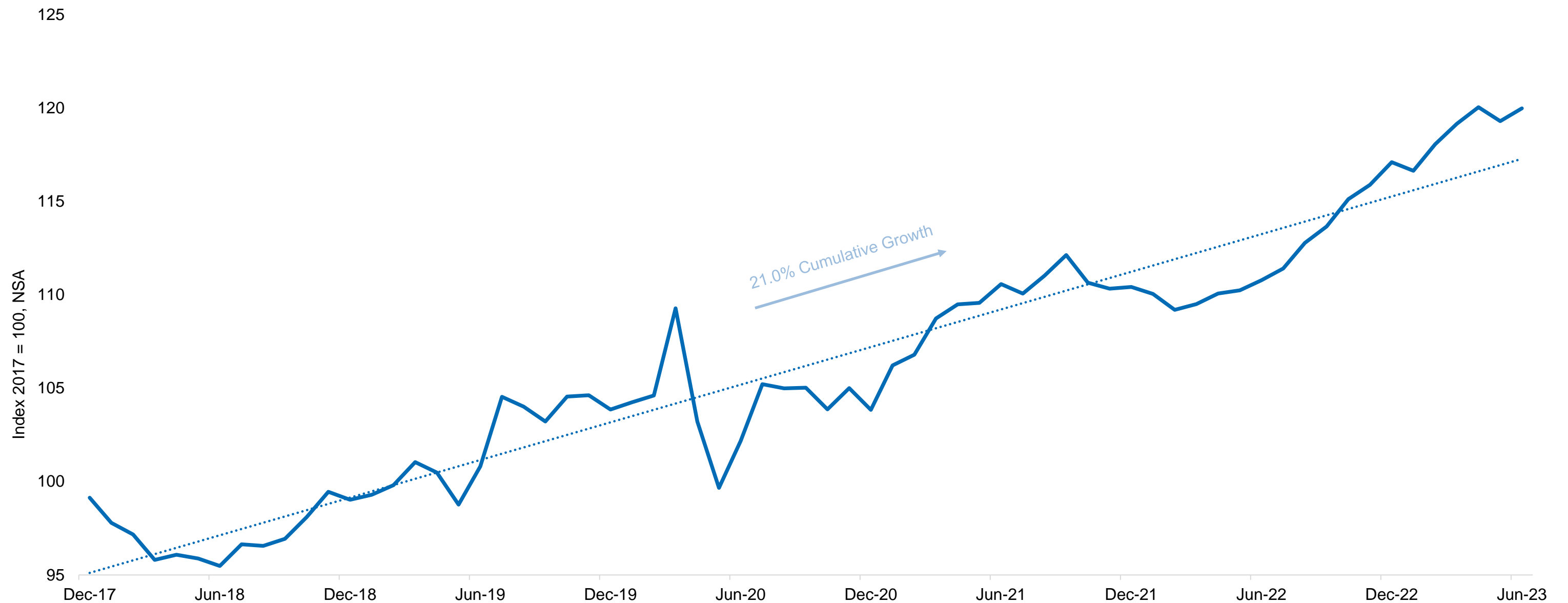


Source: Congressional Budget Office, FDA, Healthpeak Properties, Newmark Research

# Pharmaceutical Manufacturing is Growing Again in the U.S.

The industrial production of pharmaceuticals and medicine, which measures the real output of U.S.-based establishments, is at a five-year high and far outpacing overall manufacturing output. Combined with a growing drug pipeline, the onshoring of operations due to supply chain disruptions created by the pandemic have driven more recent growth in biomanufacturing output. Total manufacturing industrial production in the U.S. declined by 0.4% during that time period.

## Industrial Production: Manufacturing: Non-Durable Goods: Pharmaceutical and Medicine



Source: Board of Governors of the Federal Reserve System, Newmark Research

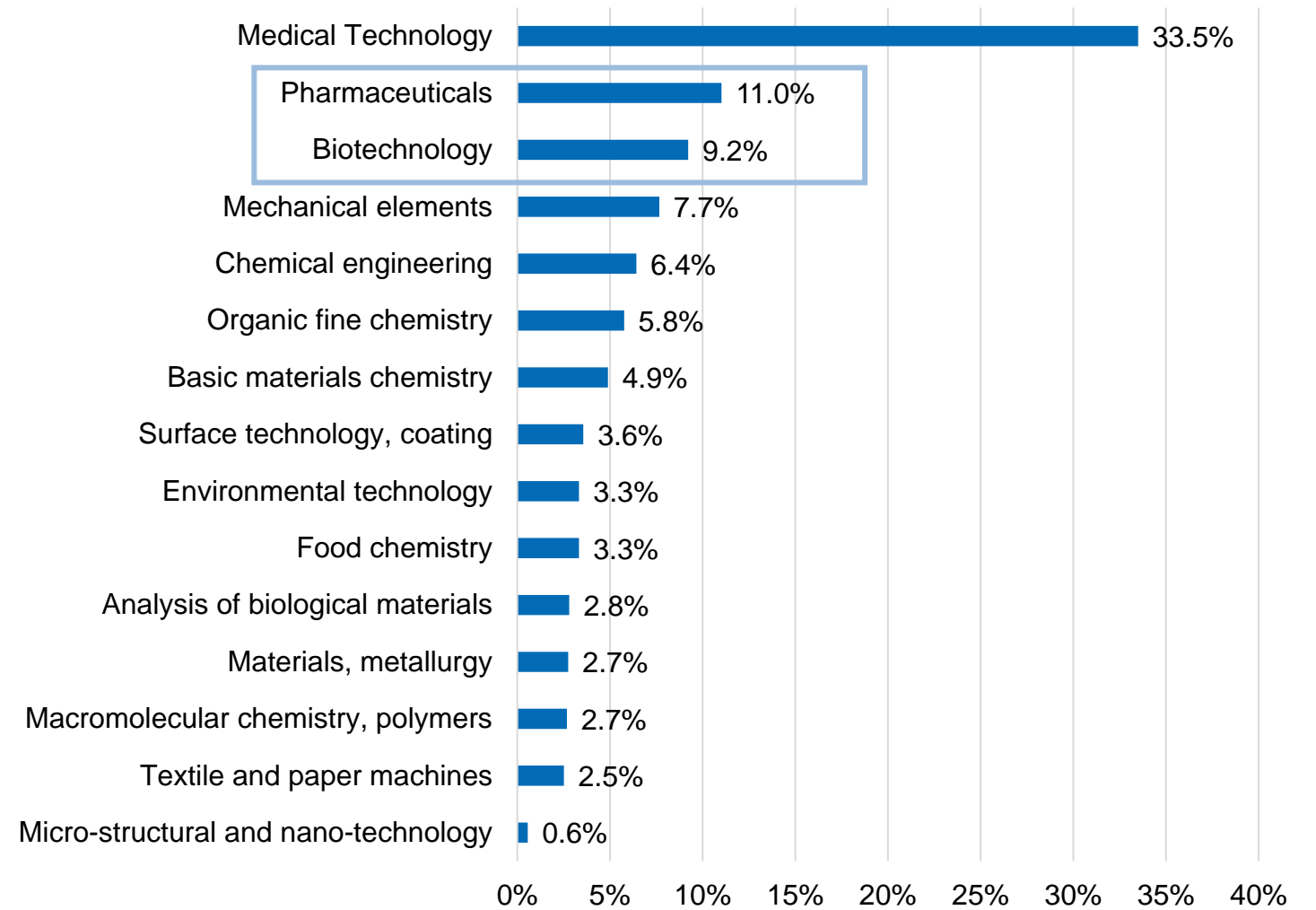
# Biotech-Related Patent Issuances Underpin Industry Growth

Despite modest declines over the last two years, nearly 39,000 patents were issued for biotech-related fields in 2021. Applicants are clearly pushing forward with new science and treatments as a result. The pharmaceutical and biotechnology fields represent 20.2% of all biotech-related patents issued in 2021, which bodes well for future growth in the U.S. life science sector.

Biotech-Related Patents Issued by Year



2021 Patents by Field of Technology

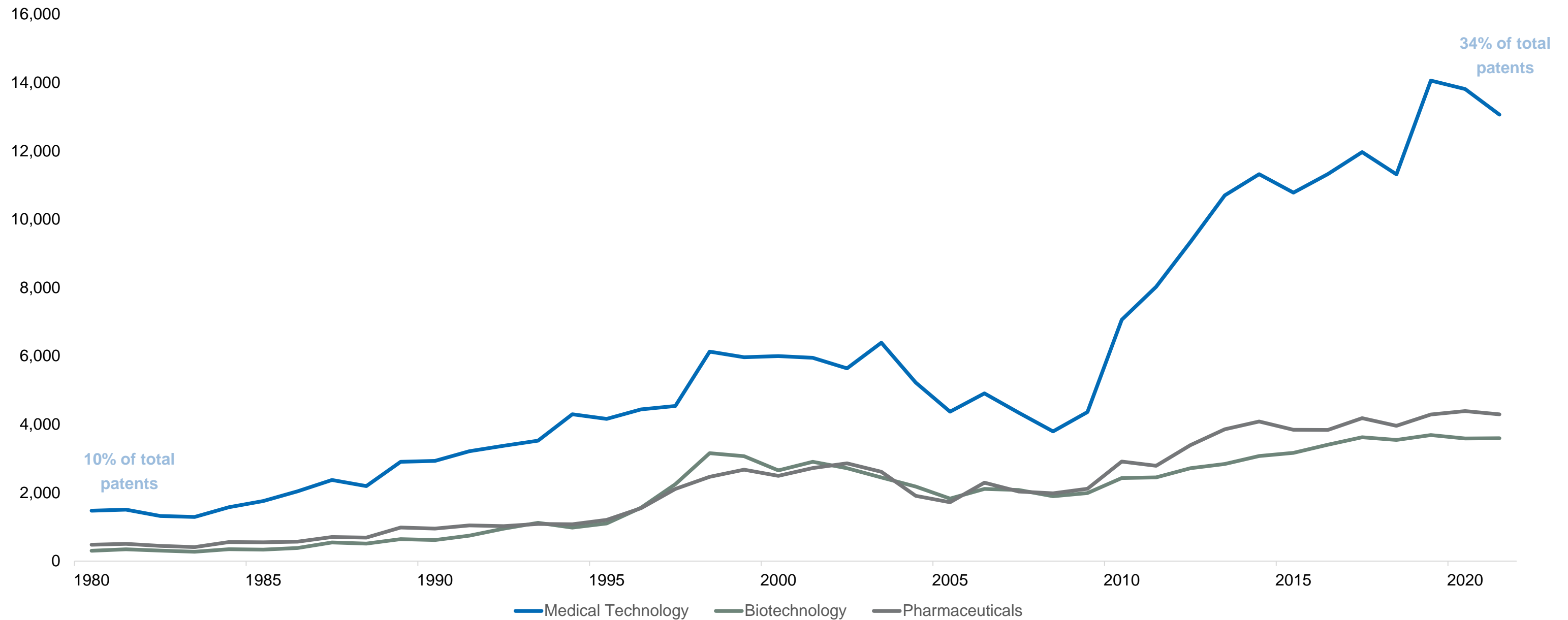


Source: WIPO Statistics Database, Healthpeak Properties, Newmark Research

# Medical Technology Patents Far Outpace All Other Fields

Patents for medical technology encompass medical devices or diagnostic techniques, while biotechnology patents concern cellular and molecular biology. Pharmaceutical patents concern new drugs, drug reformulation and new uses for drugs. While the number of biotech-related patent issuances has declined since 2019, medical technology continues to represent a larger share of the pie.

## Top Biotech-Related Fields of Technology by Patents Issued

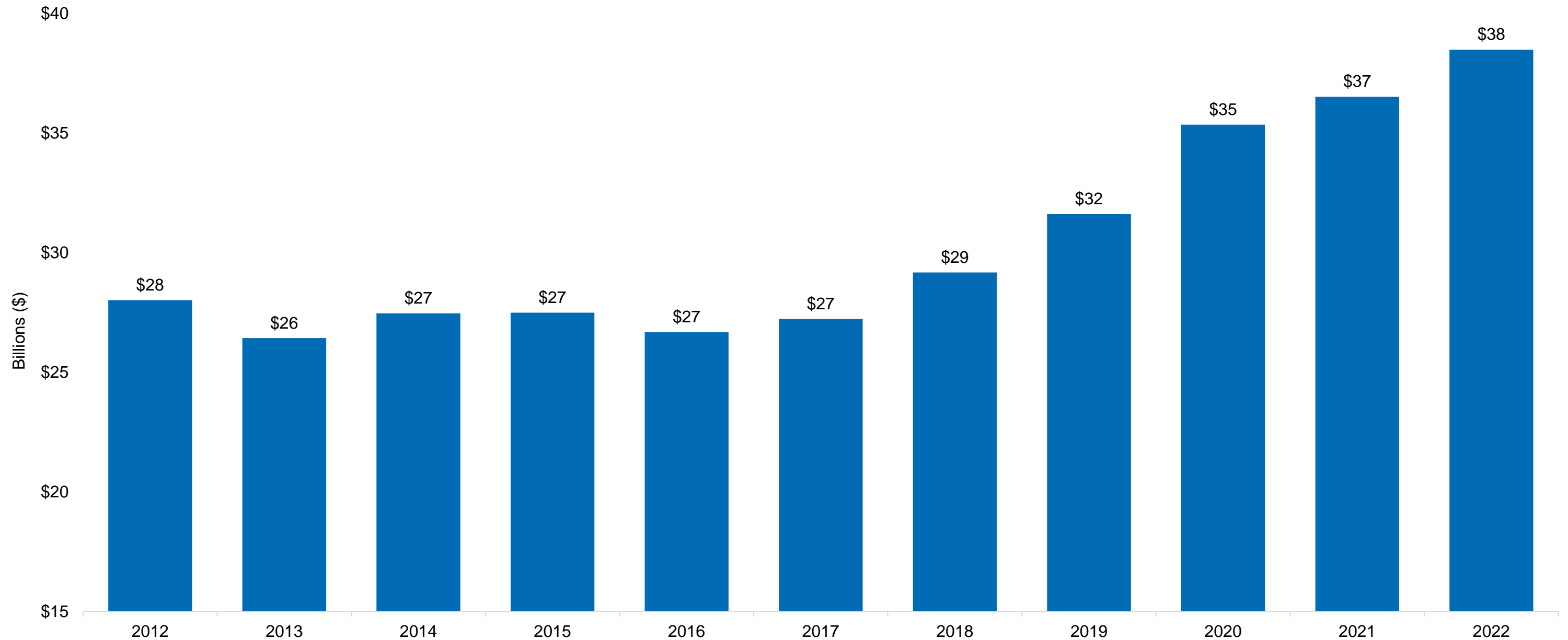


Source: WIPO Statistics Database, Healthpeak Properties, Newmark Research

# NIH Funding Growth is Fueling Institutional Research and Development

Federal funding for medical research continues to grow, with total U.S. National Institutes of Health (NIH) funding increasing by 5.4% during 2022. At roughly \$38.0 billion, funding has set a record high and remains an important part of the overall life science ecosystem within the U.S. Funding has accelerated in recent years, with most of the growth over the last 10 years occurring since 2017. The NIH budget is expected to increase in 2023 as well.

Annual NIH Funding U.S. (2012-2022)

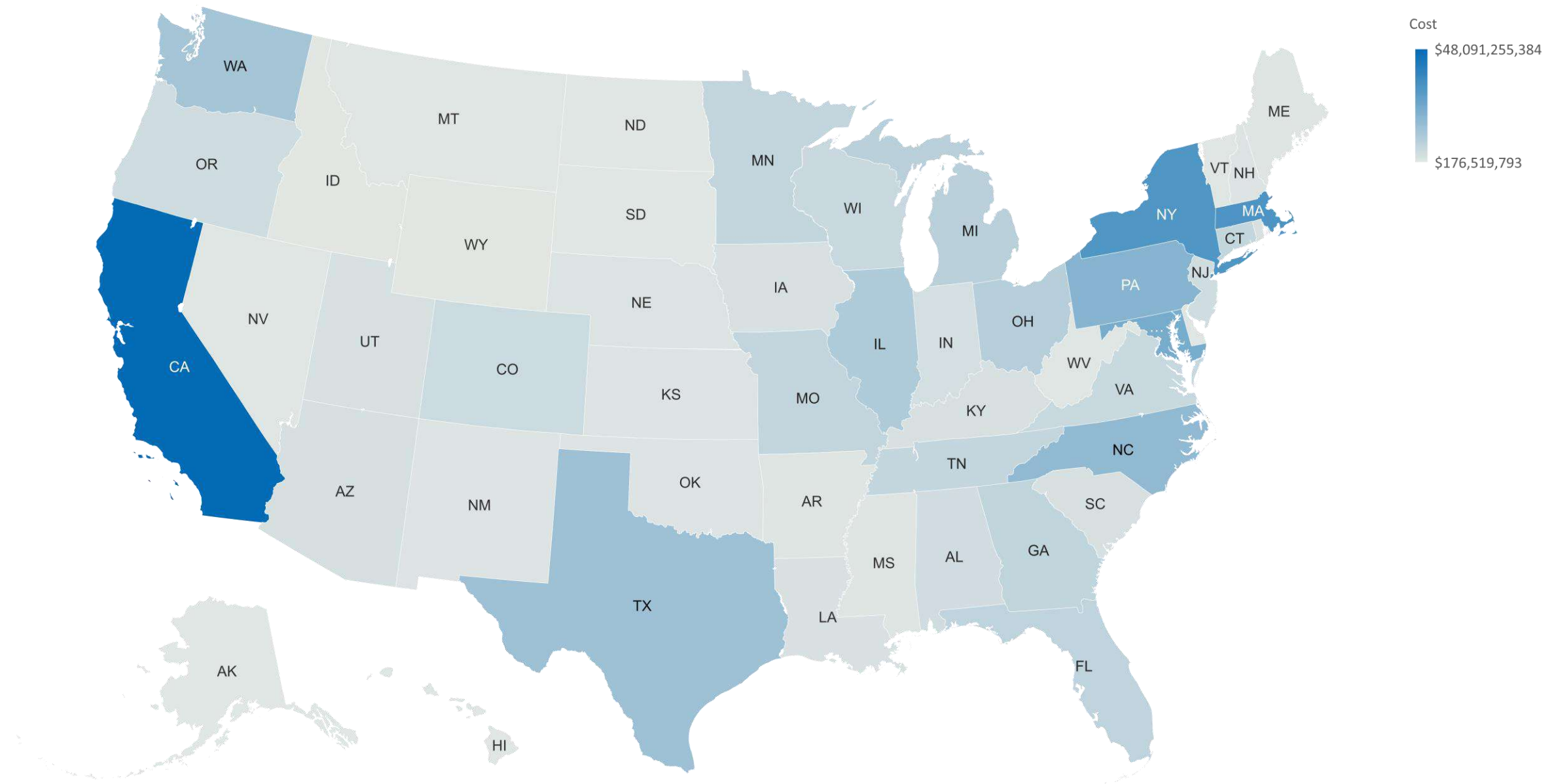


Source: National Institutes of Health, Newmark Research

# NIH Grants Remain Concentrated in Top Life Science Locations

Key life science clusters and top institutions attract a significant amount of NIH funding. At the state level, California, Massachusetts and New York top the list of total federal funding over the last 10 years. Maryland, Pennsylvania and North Carolina also ranked high on the list of dollars received from the NIH. While most of these dollars are allocated among institutions and hospitals, NIH funding helps drive overall growth in the life science sector.

## Geographic Concentration of NIH Funding (2012-2022)



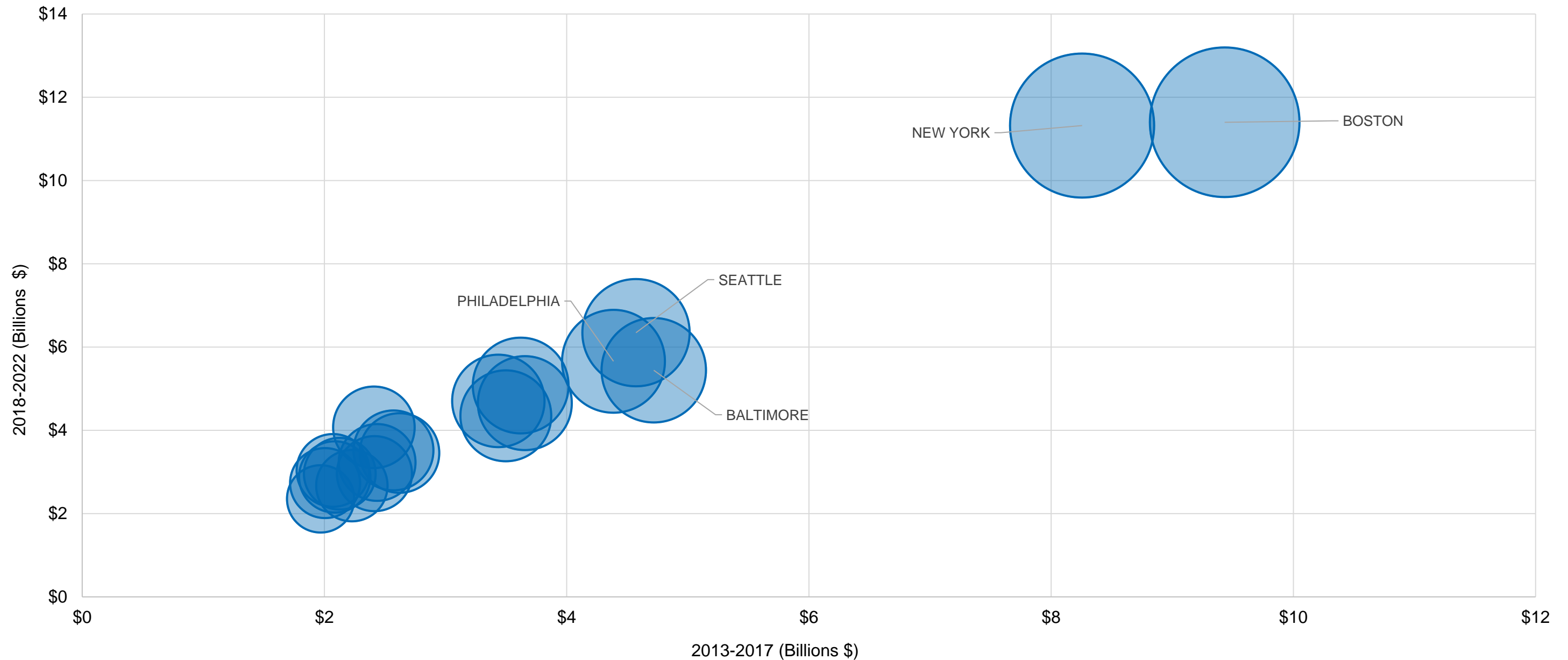
Source: National Institutes of Health, Newmark Research



# Funding Remains Concentrated in Top Cities

Boston and New York City are far and away the most funded cities by the NIH. In the last 10 years alone, Boston received \$23.0 billion in NIH grants, while New York City garnered \$21 billion in funds. These funding levels nearly double the next highest city totals, which include Seattle, Baltimore and Philadelphia. Frederick, Maryland and Stanford, California represent the only two cities to land on the top 20 cities for annual NIH funding in 2022 that were not on the list 10 years ago, implying above-average growth in grants.

## Historical NIH Funding by U.S. City

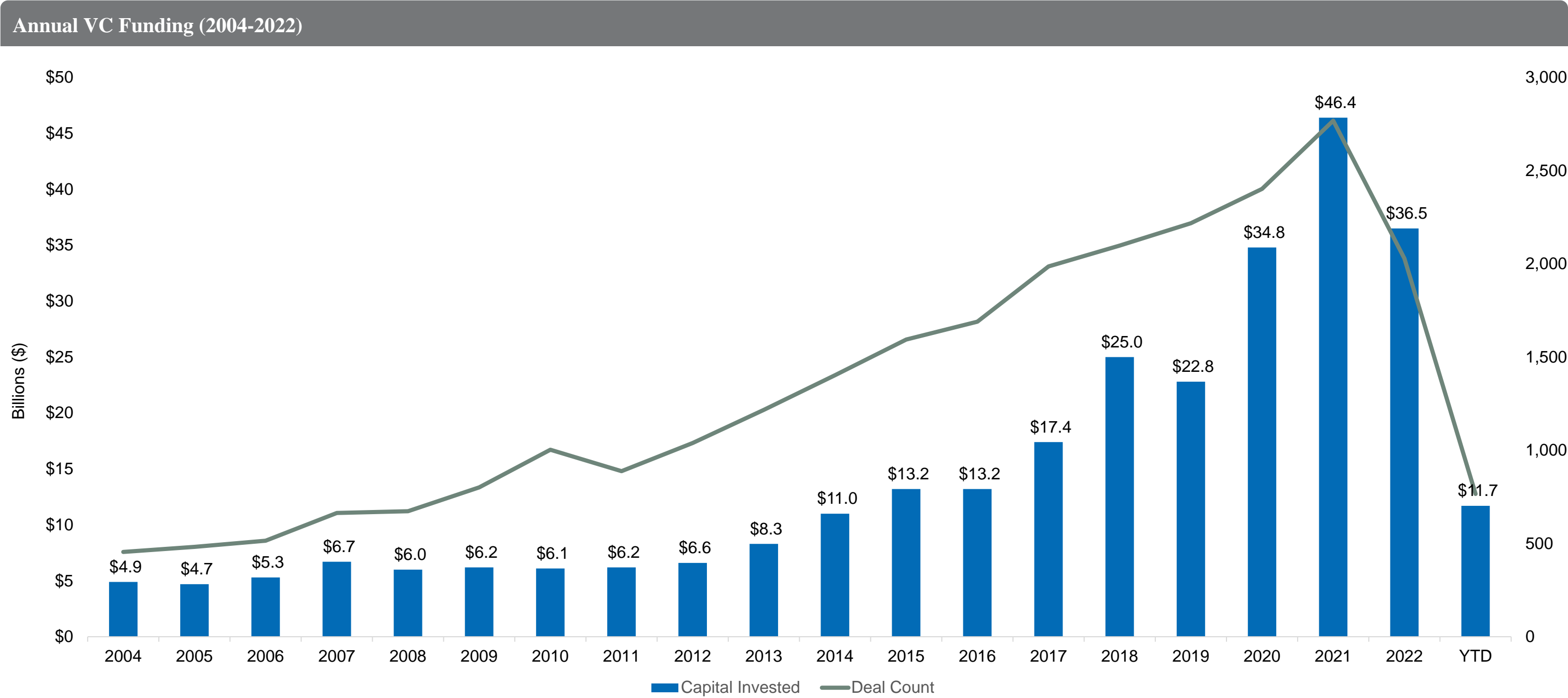


Source: National Institutes of Health, Newmark Research

Size of bubble represents total funding (\$) from 2013-2022

# Venture Capital Funding Remains Muted but in Line with Long-Term Averages

Venture capital funding for U.S. life science companies ended mid-year 2023 just below \$12.0 billion. Year-to-date deal volumes are down 32.0%; however, quarterly totals are in line with pre-pandemic levels. Investors are being even more selective in how they deploy capital compared to the heady days of 2021 and 2022. Life science companies with the most promising science should be able to raise capital but will continue to try to do more with less.

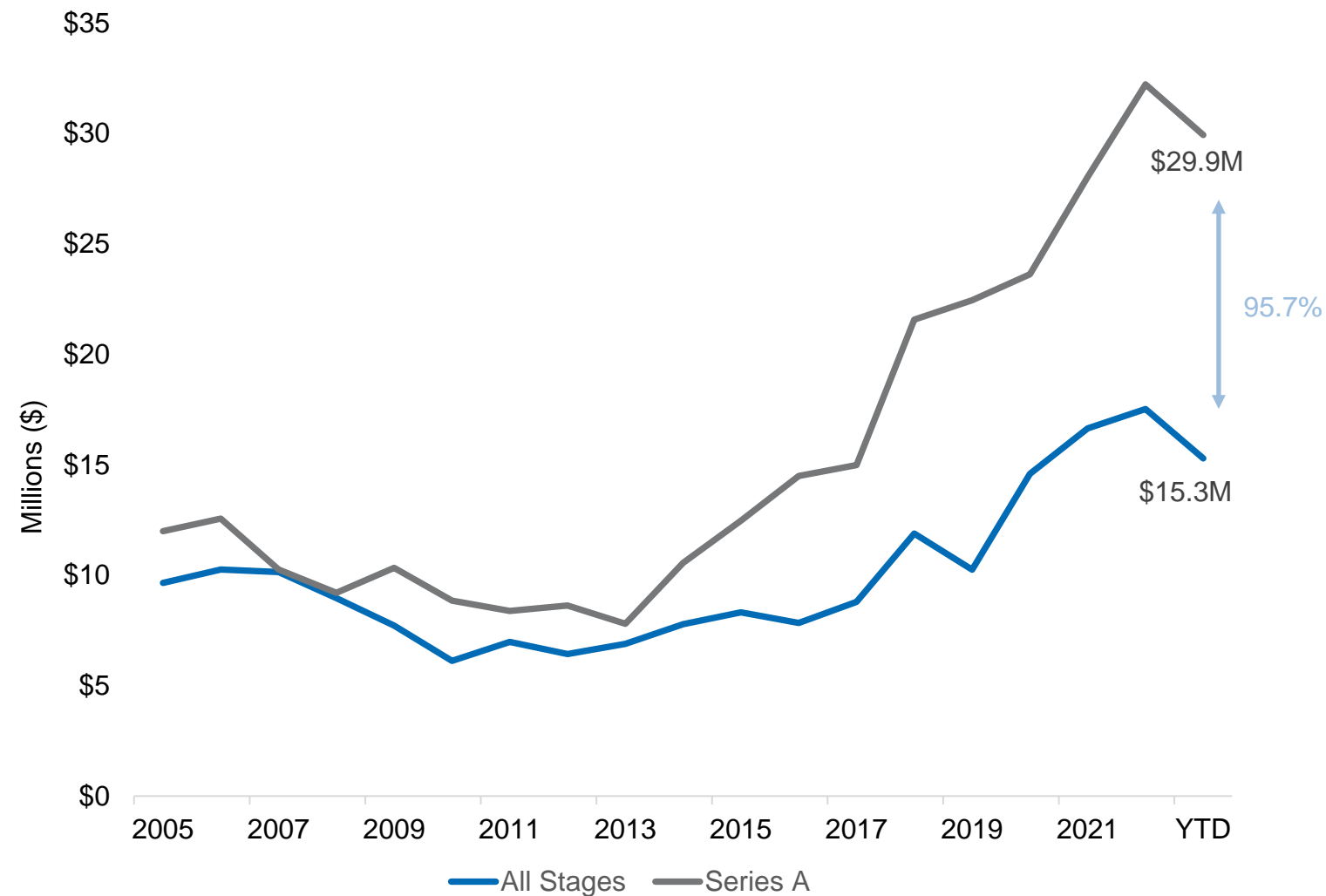


Source: PitchBook, Newmark Research

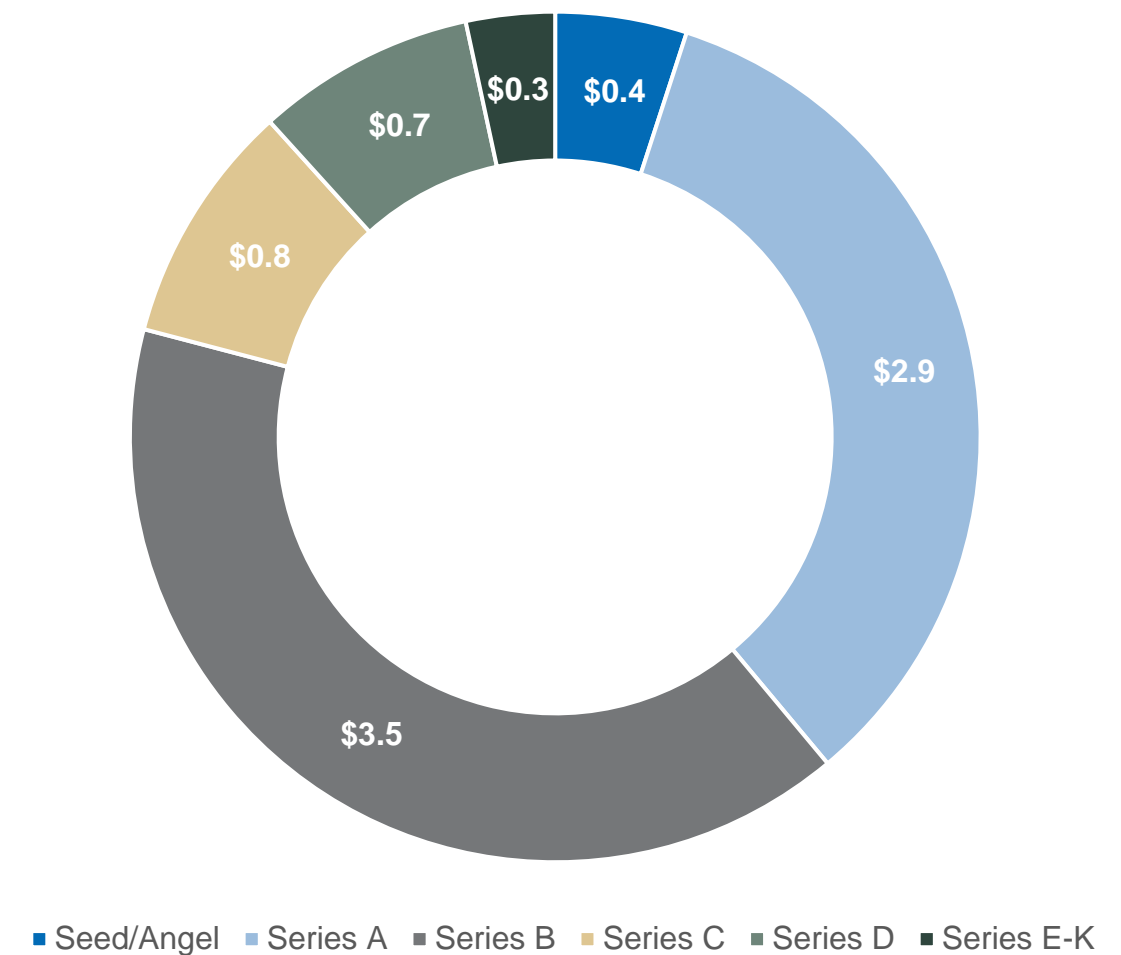
# Average Series A Round Has Never Been Higher

The average Series A funding round, which is driven by early-stage biotech companies, has been expanding rapidly since 2015. The average Series A round slipped to \$29.9 million in early 2023 but is still nearly double the average size of all funding rounds. In the first half of 2023, Series A funding accounted for 34.0% of the total throughout the U.S. Compared to a year ago, later-stage funding is more depressed than Seed and Series A-B funding volumes.

U.S. Life Science Funding: Average Deal Size



Year-to-Date U.S. Life Science Funding: By Series (in billions)

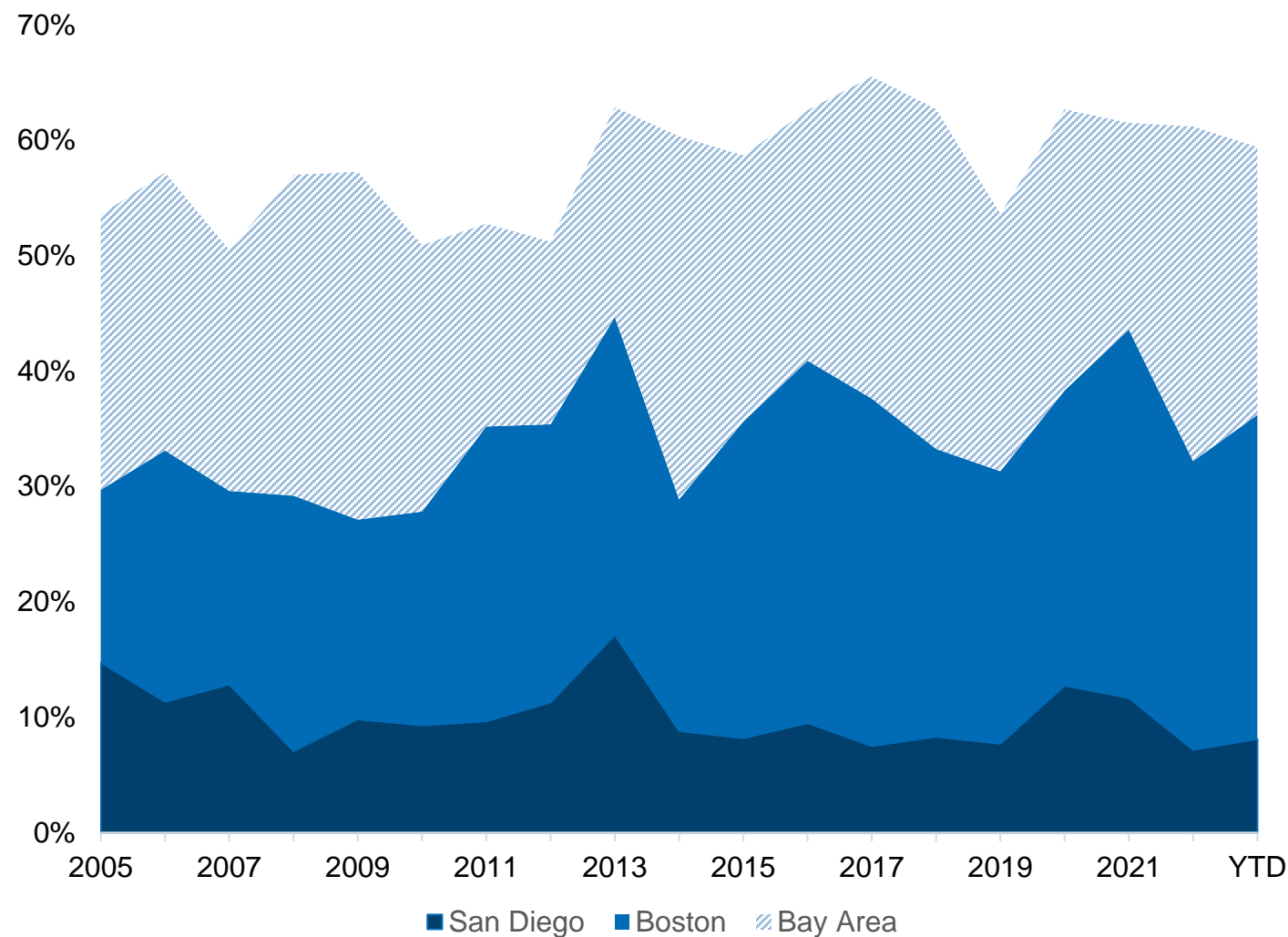


Source: PitchBook, Newmark Research

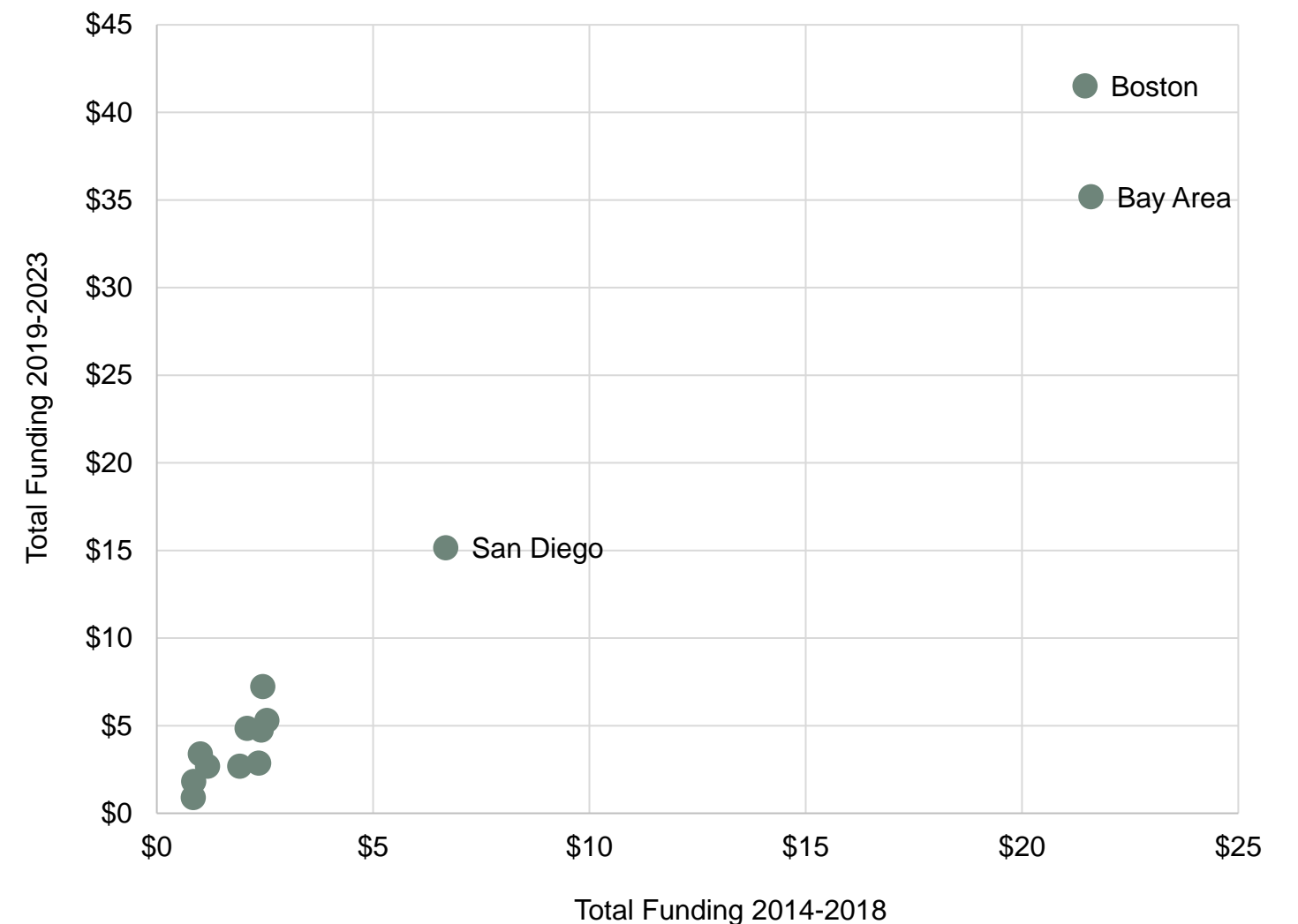
# VC Funding is Also Concentrated in Key Life Science Nodes

The top three life science hubs in the U.S. have received 55% to 70% of all venture capital funding annually. During the first half of 2023, life science companies based in these three markets raised roughly \$7.5 billion in venture funding, which equates to 63.8% of the U.S. total. All markets experienced significantly larger funding totals during the past five years when compared with the previous five years.

Historical Life Science Funding: Top 3 Clusters as % of Total



Historical Life Science Funding: By Metro (in billions)

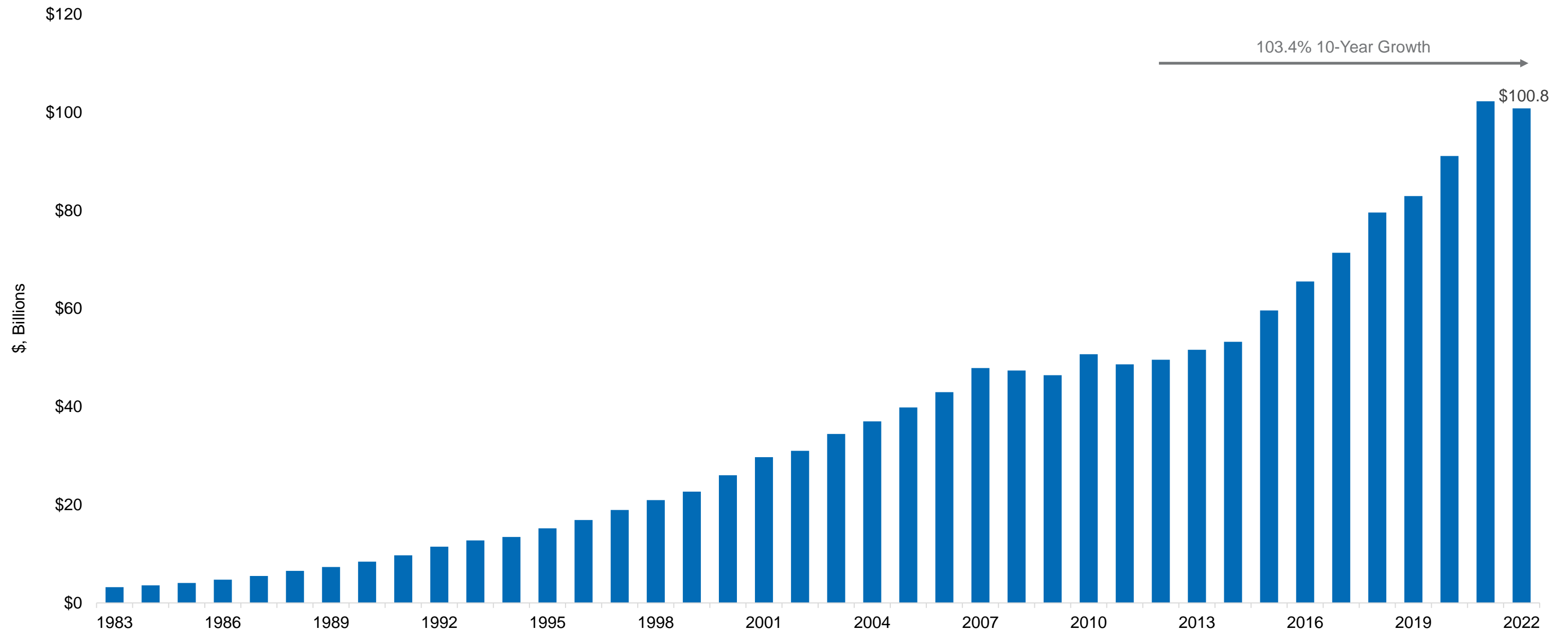


Source: PitchBook, Newmark Research

# Robust Spending in Corporate R&D is Driving Rapid Scientific Advances

In 10 years, PhRMA member companies increased research and development spending by more than 100.0%, with trillions of dollars invested over the last 30 to 40 years. Though total investment declined slightly in 2022, this represents the second consecutive year that biopharma companies have spent more than \$100 billion in R&D. Nearly 29% of R&D spending was invested in Phase III R&D activities.

## Domestic Biopharma R&D and R&D Abroad, PhRMA Member Companies



Source: Pharmaceutical Research and Manufacturers of America (PhRMA Member Companies), Newmark Research

# Public Market Performance Has Struggled Since Peaking in Late 2020

The biotech index from S&P highlights the runup in public company valuations and oversized initial public offerings. After peaking in late-2020, at the height of the market, the index remained depressed through the second half of 2023. Historically, the biotech index has trended closely with the S&P 500. However, over the last couple of years, the S&P 500 outperformed, pointing to continued weakness in the biotech sector.

## S&P Biotechnology Select Industry Index | S&P 500

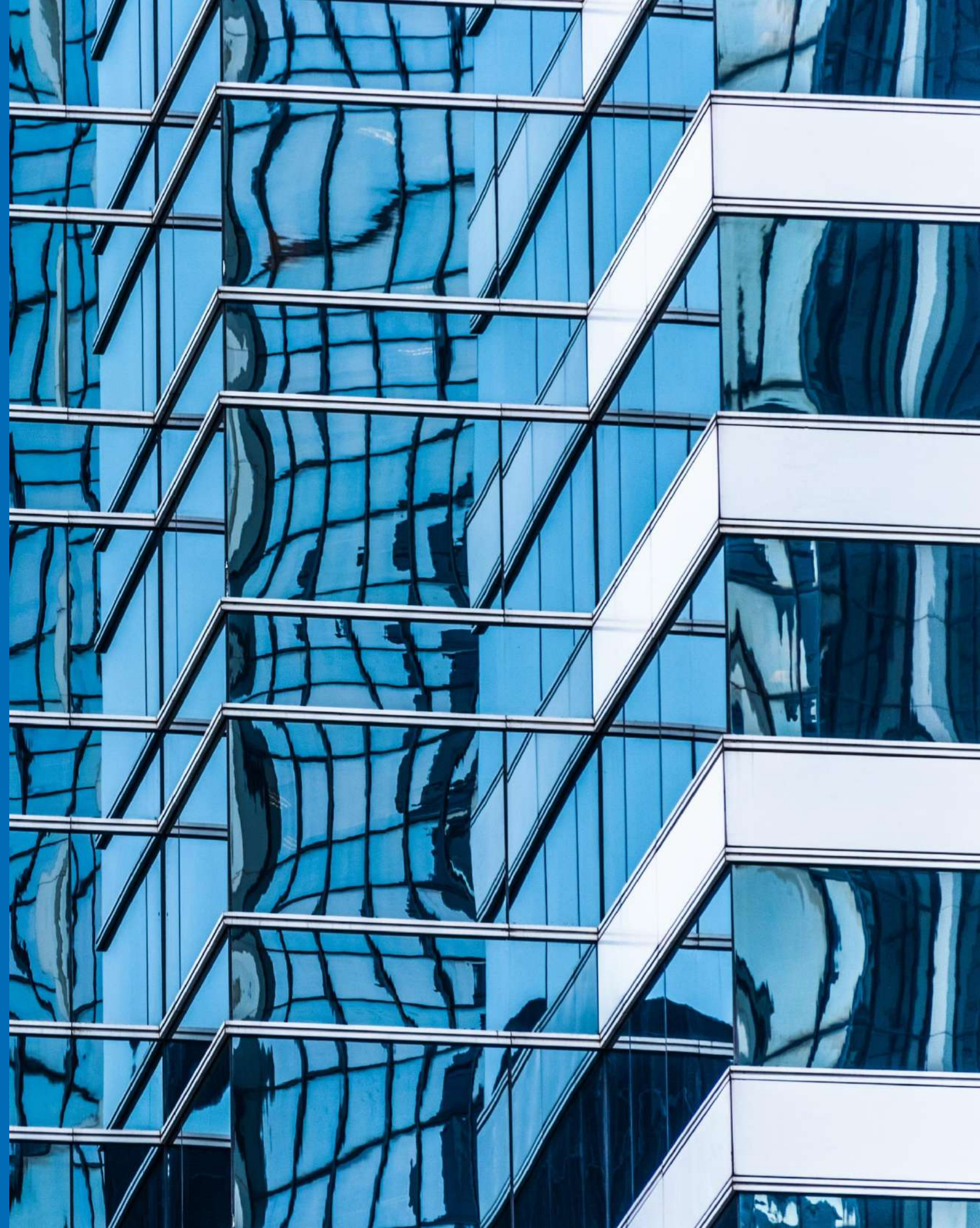


Source: S&P Global, Newmark Research

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MIDYEAR 2023 U.S. LIFE SCIENCE MARKET OVERVIEW

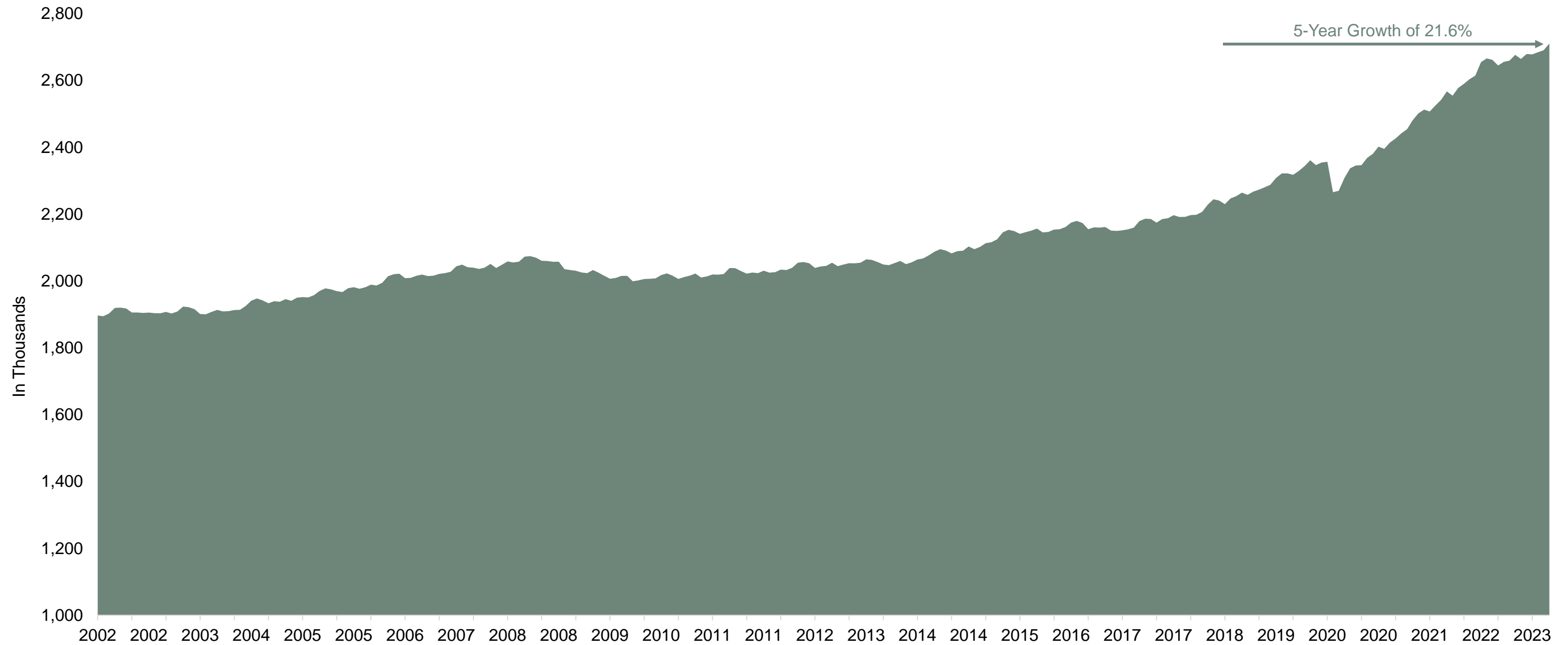
# Industry and Talent Clustering



# Employment Growth

The expansion in biotech employment began to accelerate in 2017, driven by growth in funding, IPO activity and real estate fundamentals in the life science sector. Total employment increased by 21.6% over the last five years. During the first half of 2023 this sector gained another 34,000 jobs, driven by a solid rebound in June hiring. Comparatively, total U.S. employment only grew by 4.7% from the second quarter of 2018 to the second quarter of 2023.

## Total U.S. Biotech Employment



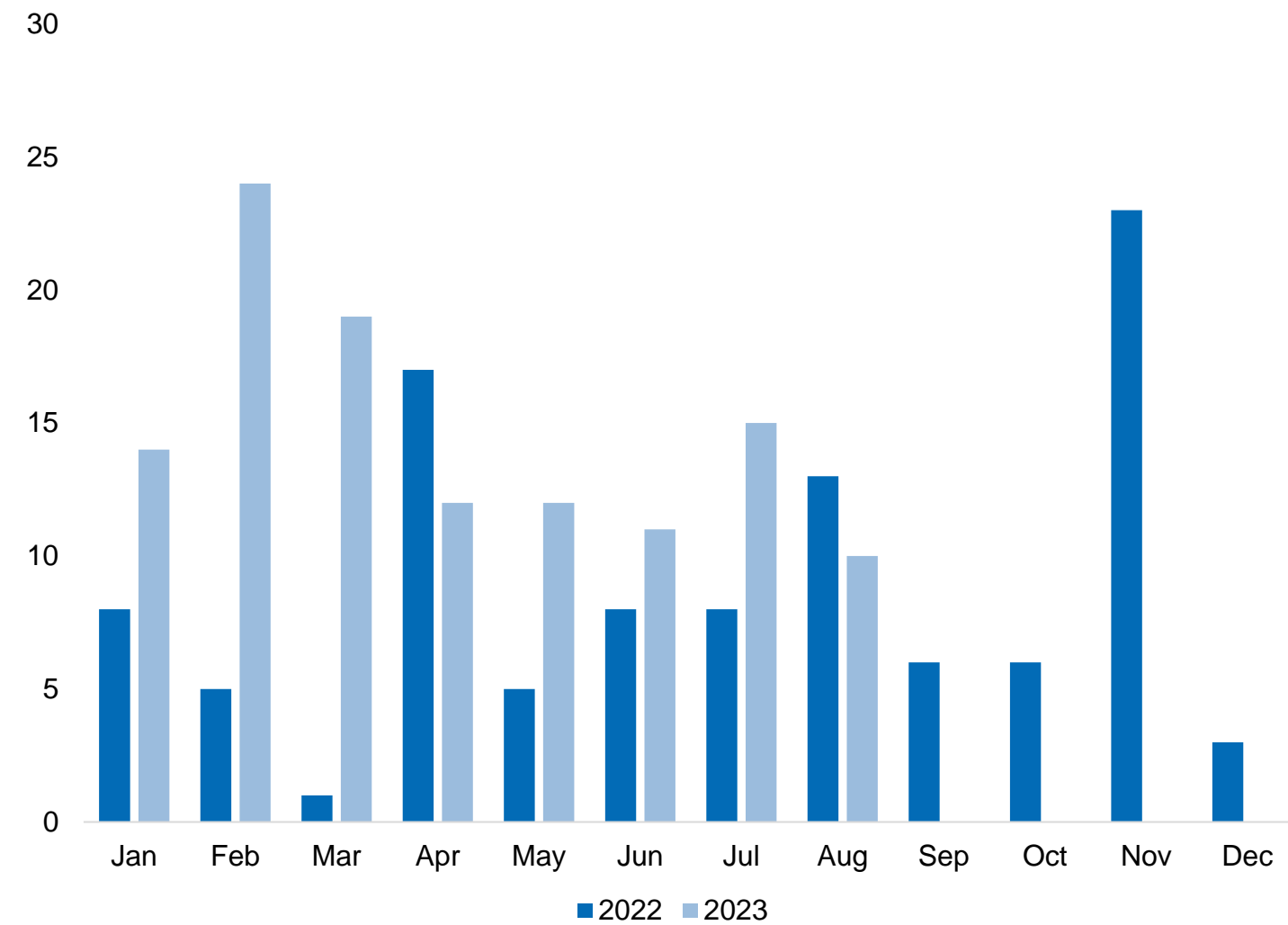
Source: Moodys, BLS, Newmark Research



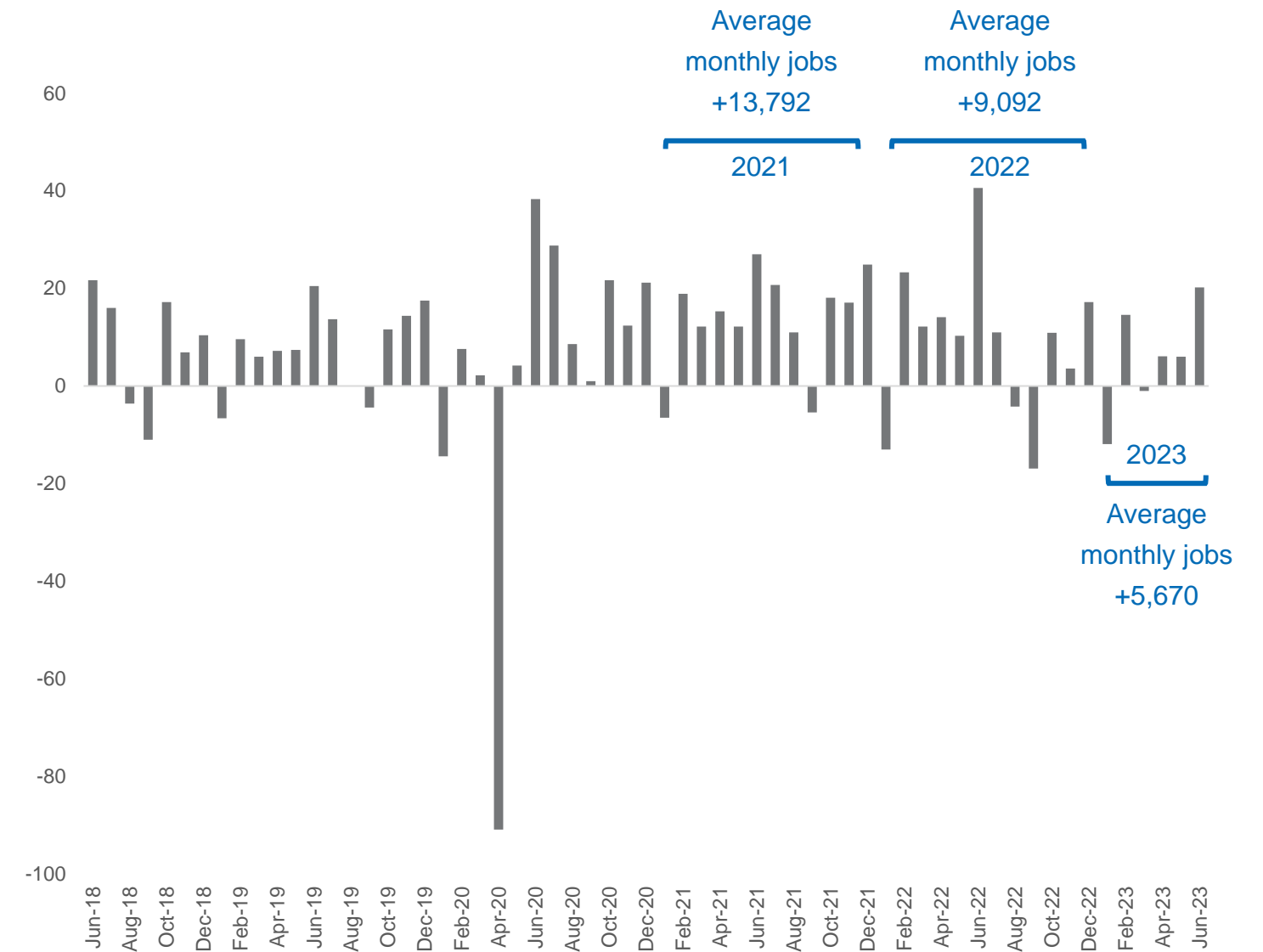
# Despite Sector Headwinds Employment Growth Rebounded in June

According to data from Fierce Biotech, 220 life science companies have announced layoffs since the start of 2022. While employment growth improved significantly at the end of the second quarter of 2023, average monthly job gains in the life science sector continue to track below recent historic norms.

Number of Life Science Companies Announcing Layoffs



Monthly Change in Life Science Employment

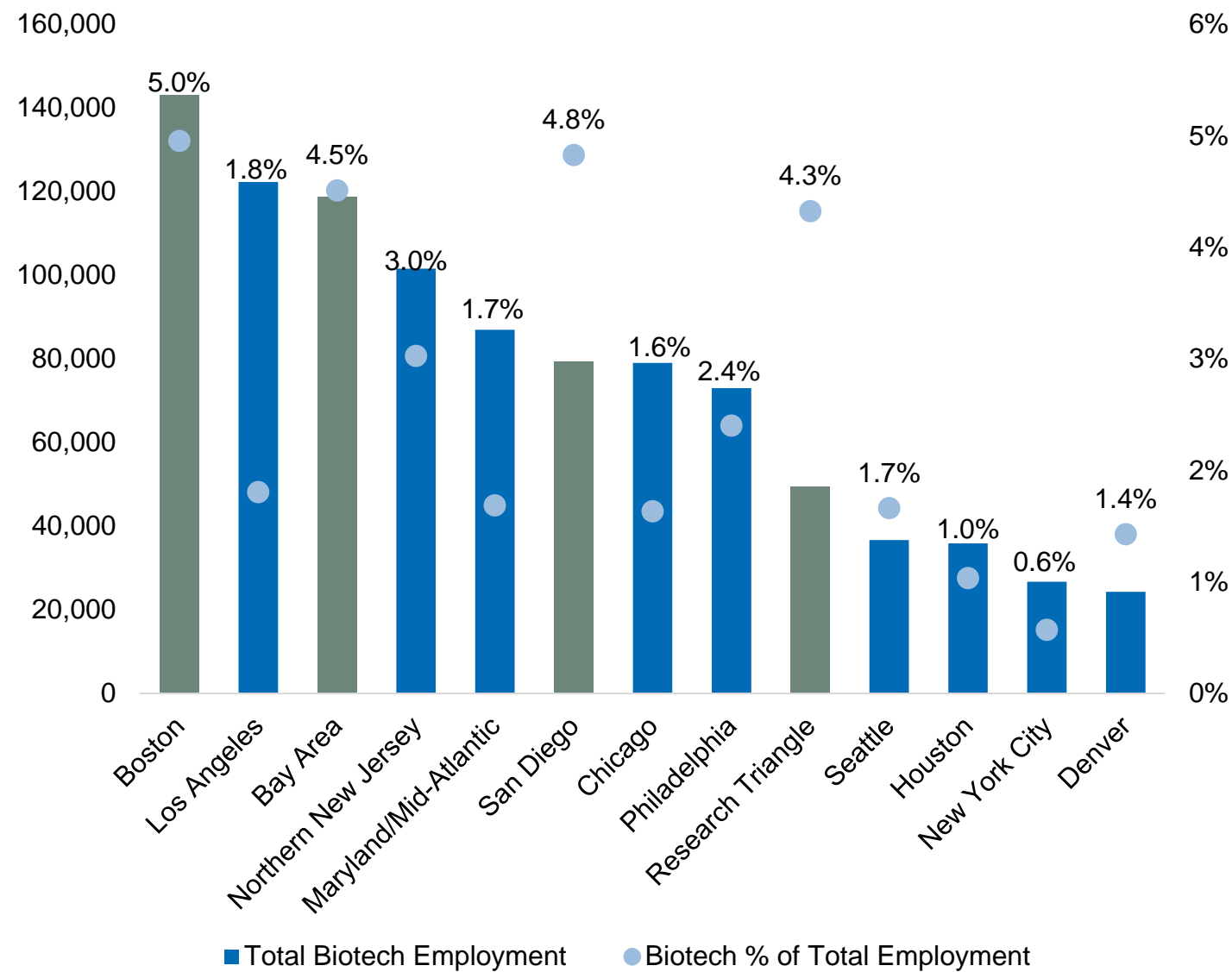


Source: Fierce Biotech, Moodys, Newmark Research

# Key Hubs Maintain High Concentrations of Biotech Employment

The top four metros boast the highest concentrations of biotech employment within the U.S. Access to a deep talent pool remains a critical driver of tenant demand and growth within the industry.

Concentration of Biotech Employment by Metro



Biotech Location Quotient by Metro

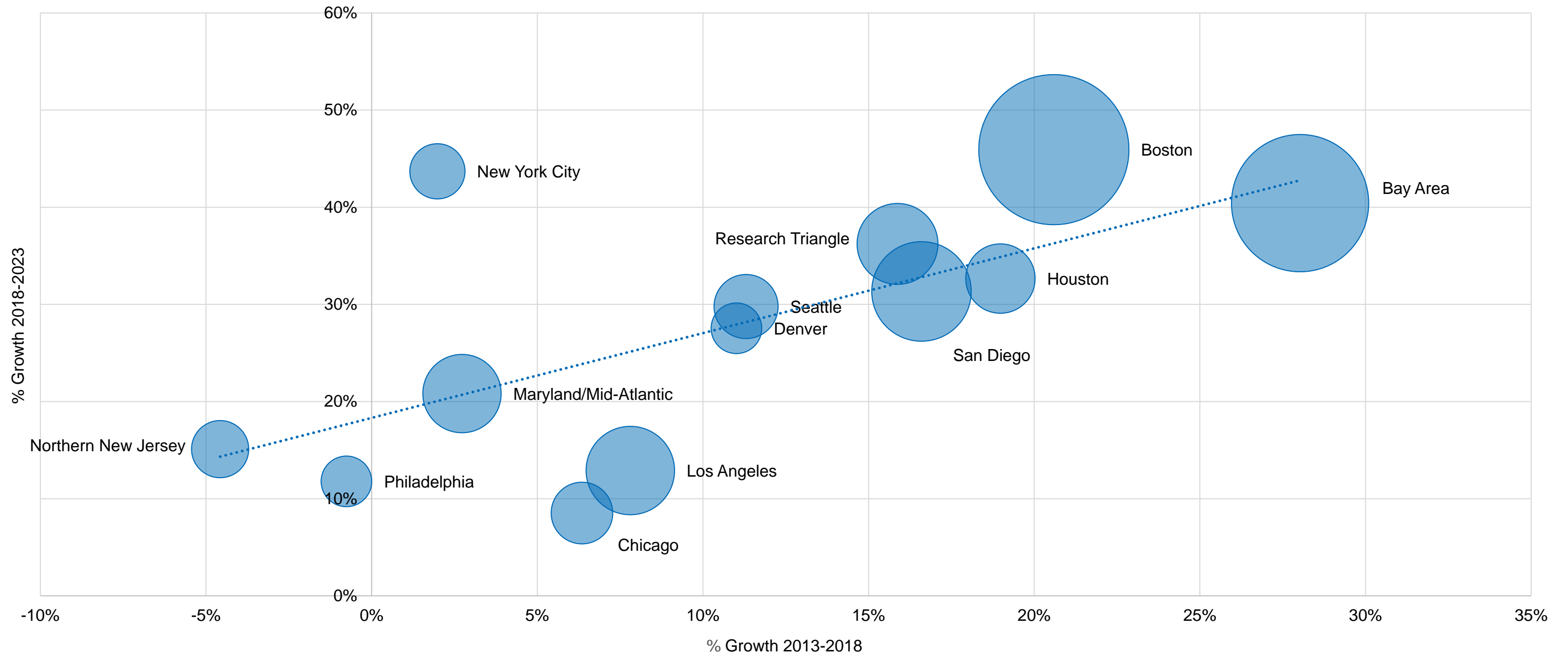
Metro	Biotech Employment	Location Quotient
Boston	142,740	3.23
San Diego	78,450	2.99
Bay Area	116,197	2.79
Research Triangle	49,304	2.77
Northern New Jersey	101,578	1.90
Philadelphia	72,725	1.54
Los Angeles	120,682	1.12
Maryland/Mid-Atlantic	87,098	1.08
Seattle	36,979	1.07
Chicago	78,828	1.04
Denver	24,363	0.92
Houston	36,308	0.67
New York City	26,705	0.36

Source: JobsEQ, Newmark Research

# Large Markets Also Boast Above-Average Job Gains

On a nominal level, the top three markets for life science activity added the most jobs over the last 10 years. Employment growth from 2018 to 2023 in most markets far outpaced the previous five-year expansion period. Boston topped the list for growth, with biotech jobs increasing by roughly 46.0% since 2018. Year-over-year gains are slowing in the face of more challenging market conditions.

## Historical Biotech Employment Growth by Metro



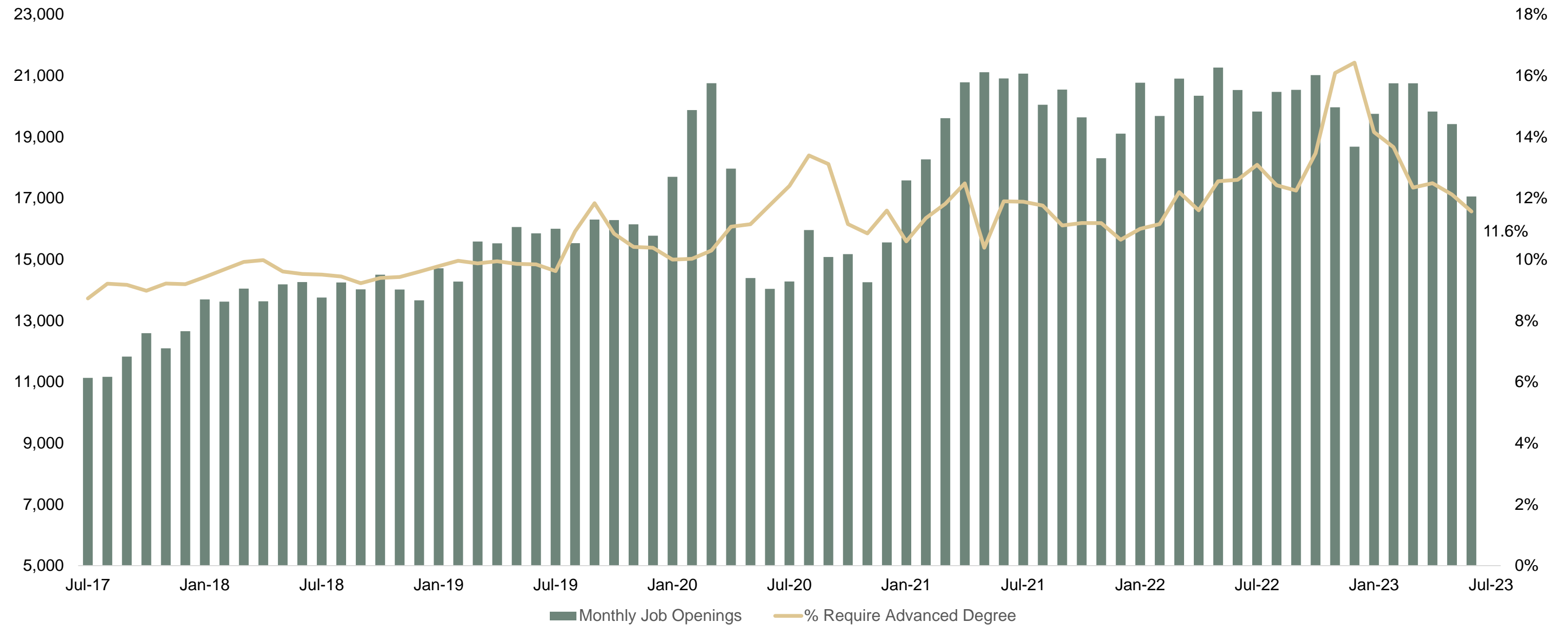
Source: JobsEQ, Newmark Research

Size of bubble represents total biotech jobs added since 2013

# Biotech Job Openings Are at a Three-Year Low

Tumult in the life science sector led to persistent layoff announcements and lower job openings within the U.S. market during the second quarter of 2023. As of June 2023, there were more than 17,000 active job openings, which represents a three-year low. Many of these new openings only require a bachelor's degree. As a result, the percentage of jobs needing an advanced degree declined to 11.6%.

## Biotech Job Openings

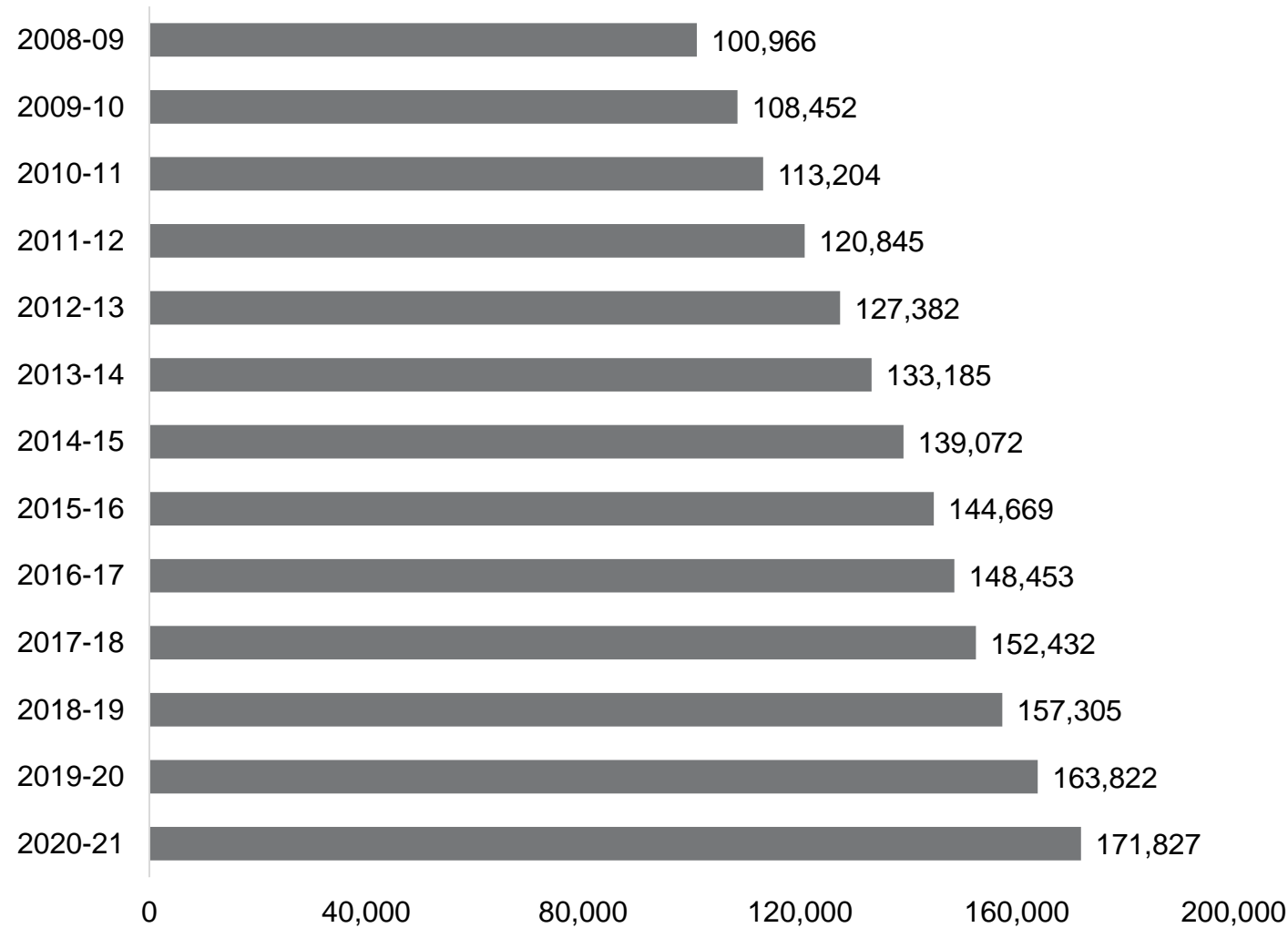


Source: JobsEQ, Newmark Research

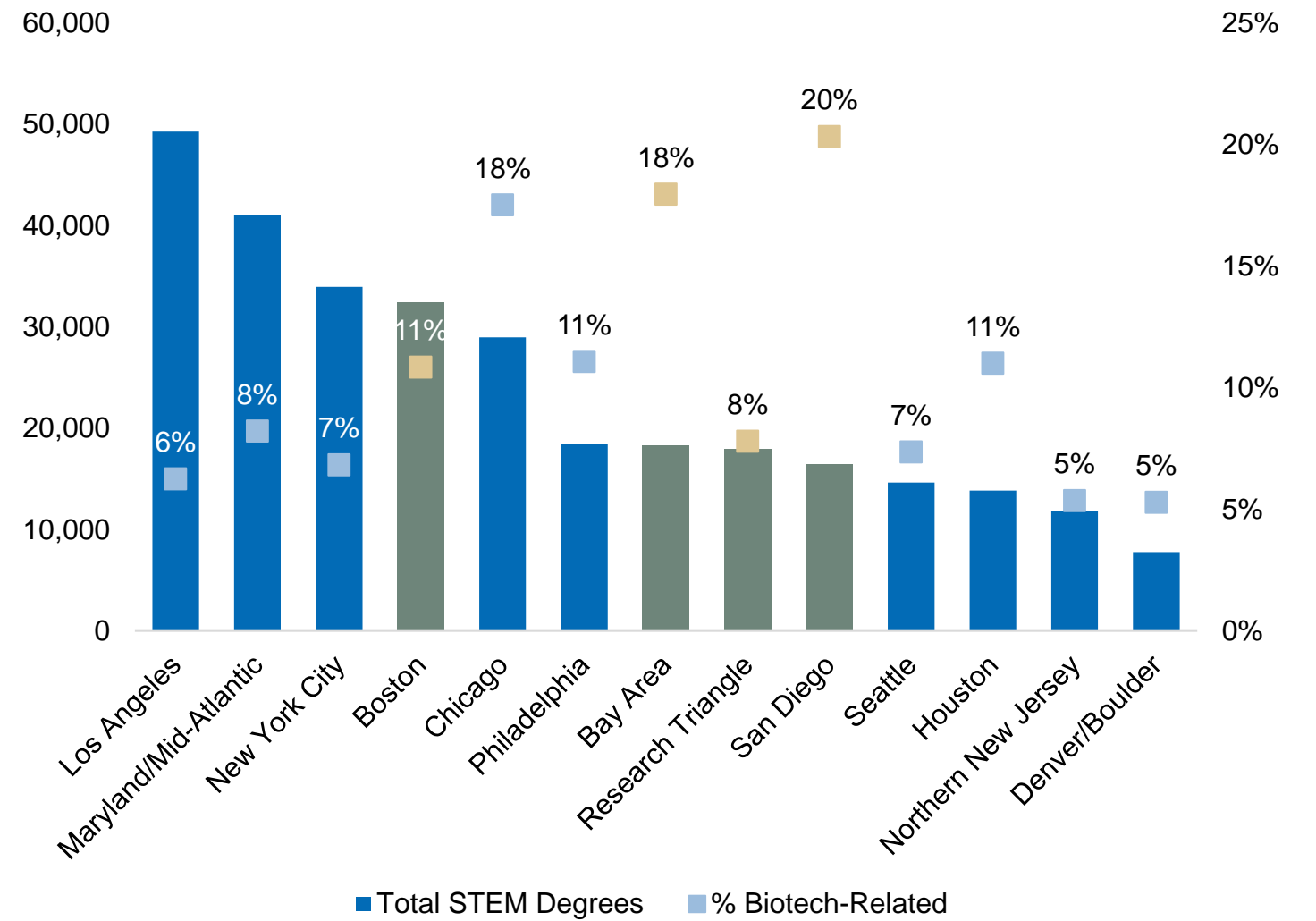
# STEM Degrees Fuel Future Biotech Talent

The number of biological and biomedical science degrees awarded each year continues to grow, expanding by 70.0% since 2008. In select metros, 18.0% to 20.0% of all STEM degrees issued are within biotech-related fields. San Diego boasts the highest concentration of biotech-related STEM degrees.

### Biological and Biomedical Sciences Degrees Awarded



### STEM Degrees by Metro



Source: JobsEQ, National Center for Education Statistics, Newmark Research

# Colleges and Universities Support the Talent Pipeline

The concentration of top educational institutions is vital to the life science ecosystem. To keep the pipeline filled with qualified employees, top markets for life science are also home to many colleges and universities that produce the most life science degrees. In fact, 23 out of the 30 top schools for life science degrees are in a major biotech hub.

## Top 30 Universities for Life Science Degrees – Major Biotech Hubs

Harvard University (1)	University of Pennsylvania (14)
MIT (2)	UCLA (15)
Stanford University (3)	Duke University (16)
California Institute of Tech (4)	UC Davis (17)
Princeton University (6)	NYU (20)
UC Berkeley (7)	Northwestern University (21)
Johns Hopkins (8)	UNC Chapel Hill (23)
Columbia University (9)	Emory University (24)
UC San Diego (10)	UC Santa Barbara (28)
University of Washington (11)	Boston University (29)
University of Chicago (12)	UMass (30)

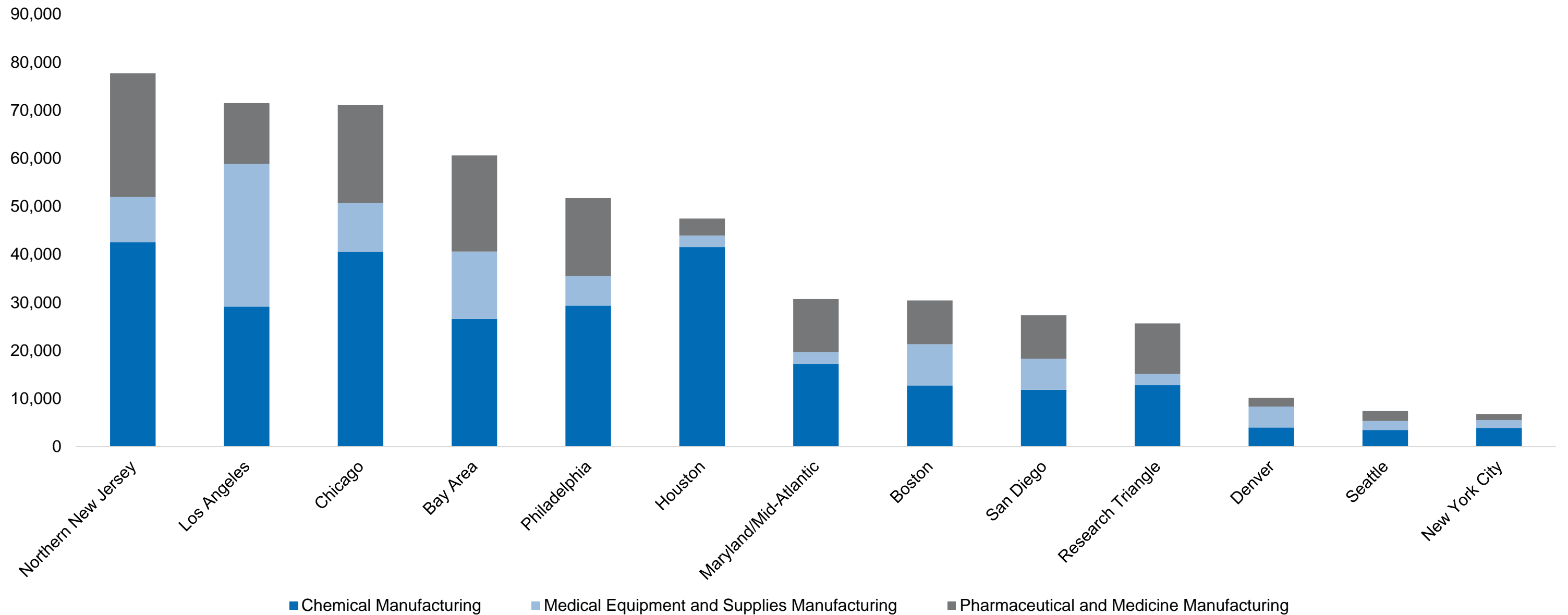
## Top 30 Universities for Life Science Degrees – Outside Biotech Hubs

Yale University (5)
Cornell University (13)
University of Michigan (18)
Washington University (19)
University of Wisconsin Madison (21)
University of Illinois (25)
University of Minnesota (25)
Vanderbilt University (27)

# The Talent Pool for Biomanufacturing Remains Limited

Due to nearshoring and onshoring trends, the need for employees with specific skillsets related to biomanufacturing is increasingly in demand. Nominally, Chicago, the Bay Area and Philadelphia maintain the largest number of pharmaceutical and medicine manufacturing jobs; however, as a percent of total employment, the Research Triangle and Northern New Jersey are near the top of the list.

## 1Q2023 Life Science-Related Manufacturing Jobs

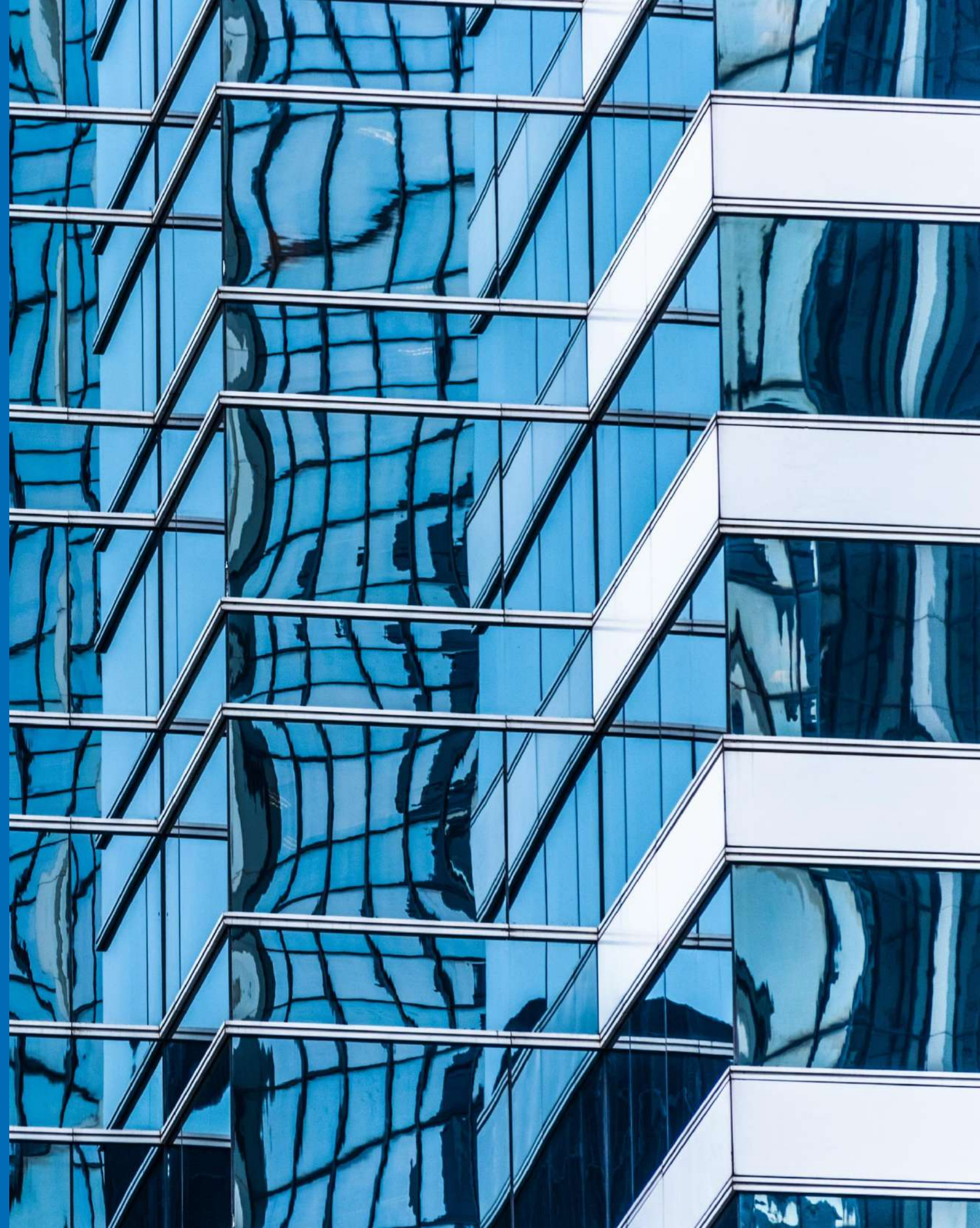


Source: JobsEQ, Newmark Research

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MIDYEAR 2023 U.S. LIFE SCIENCE MARKET OVERVIEW

# Market Fundamentals

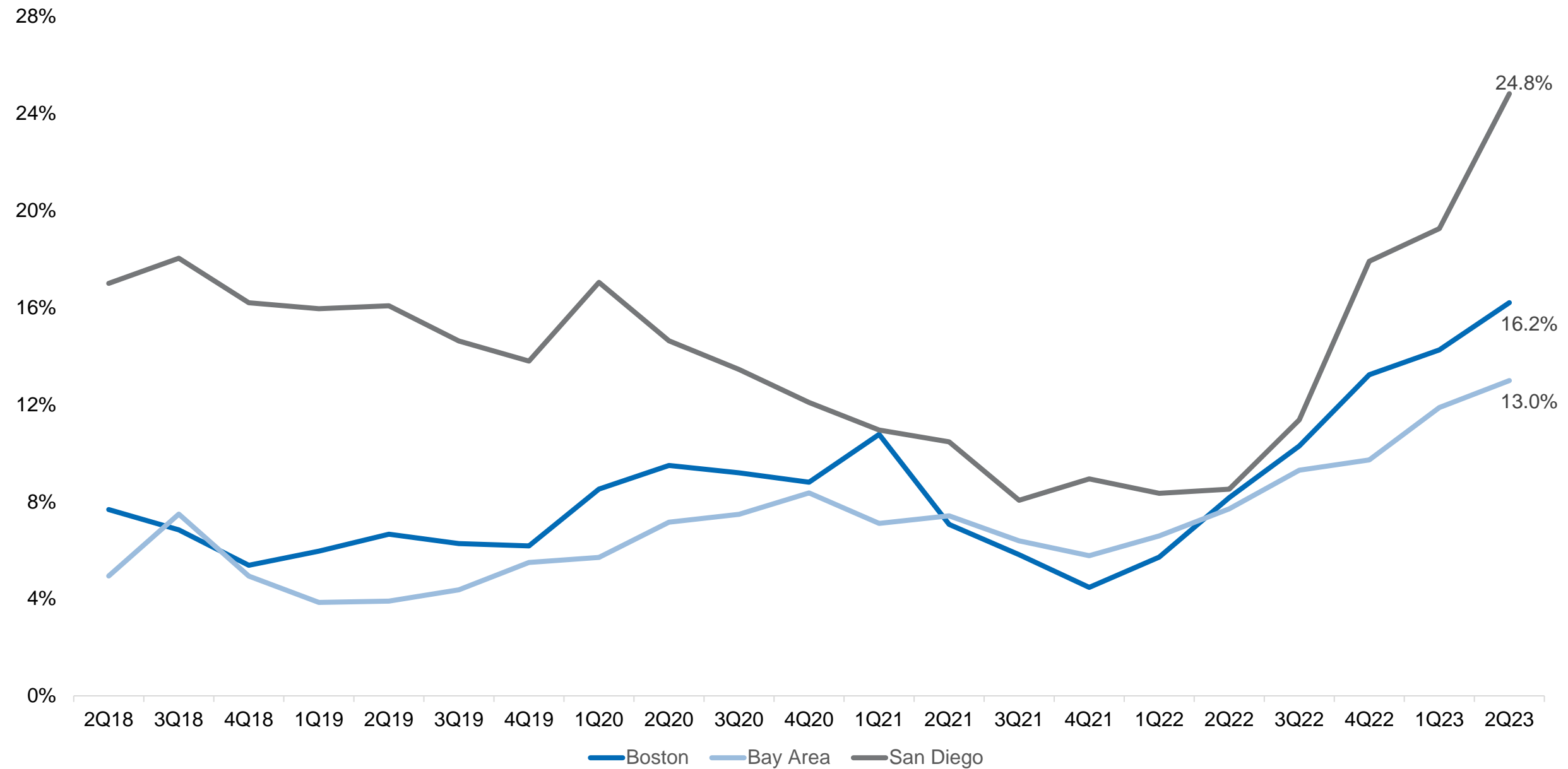




# Availabilities Continued to Climb Through Midyear 2023

Laboratory availabilities within the top three U.S. life science clusters have been rising precipitously since late-2021 as supply-side pressures and waning demand characterize the sector. Bay Area availabilities are the lowest, ending the second quarter of 2023 at 13.0%. Across all three markets, availability is tracking well above historic norms as well. This trend is expected to continue in the near term as a bevy of new developments are slated to come on line over the next 12 to 24 months.

## Total Laboratory Availability

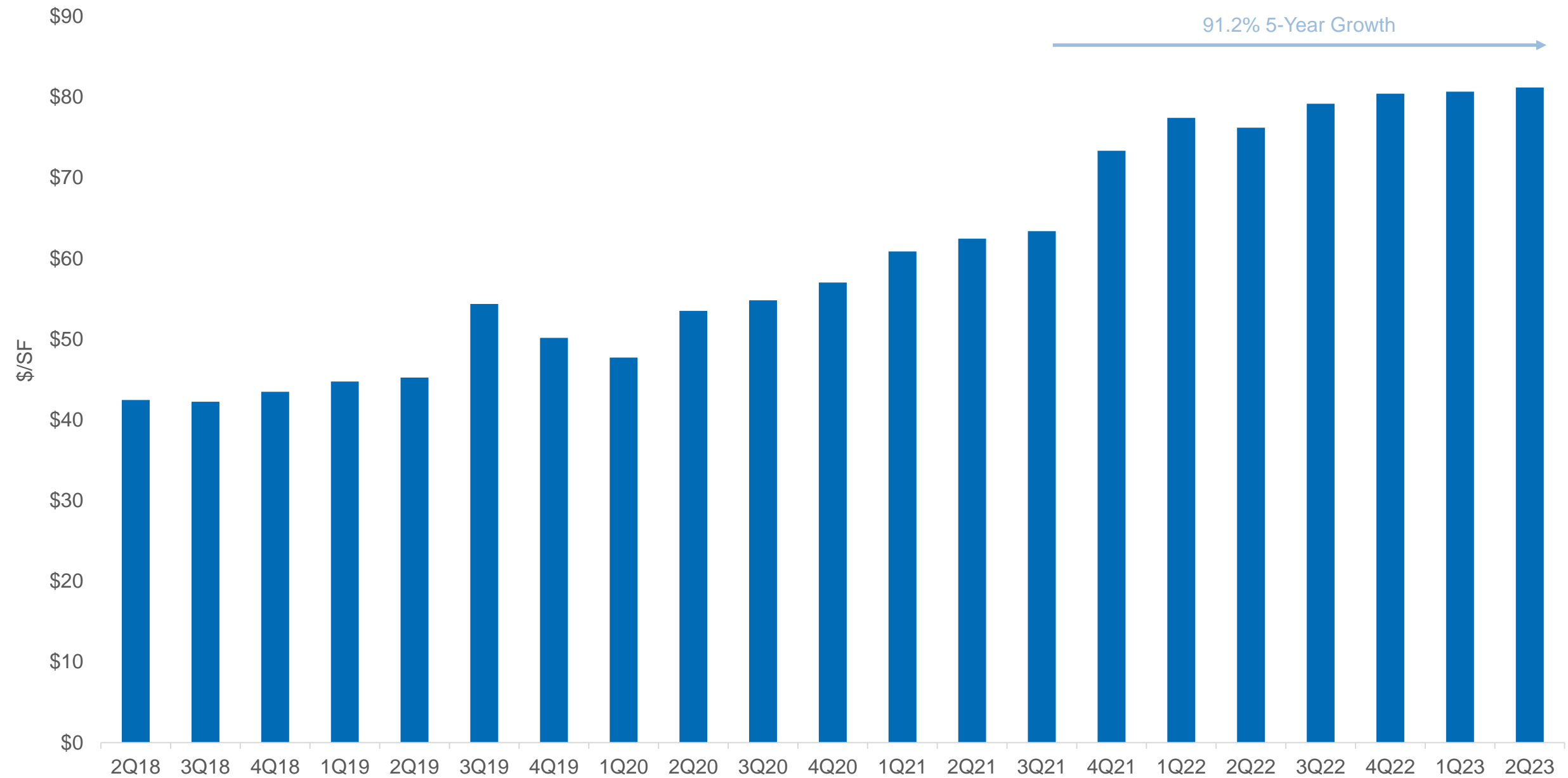


Source: Newmark Research

# Despite Rising Vacancies, Laboratory Rents Reach New Peak

Over the last five years, asking rents for laboratory space expanded by more than 90.0% in the top three U.S. life science clusters. On a quarterly basis, rent growth has clearly slowed and Boston lease rates have been declining for several quarters. Given the trajectory of fundamentals, these trends are expected to persist.

## Total Average Asking Rent (NNN)\*

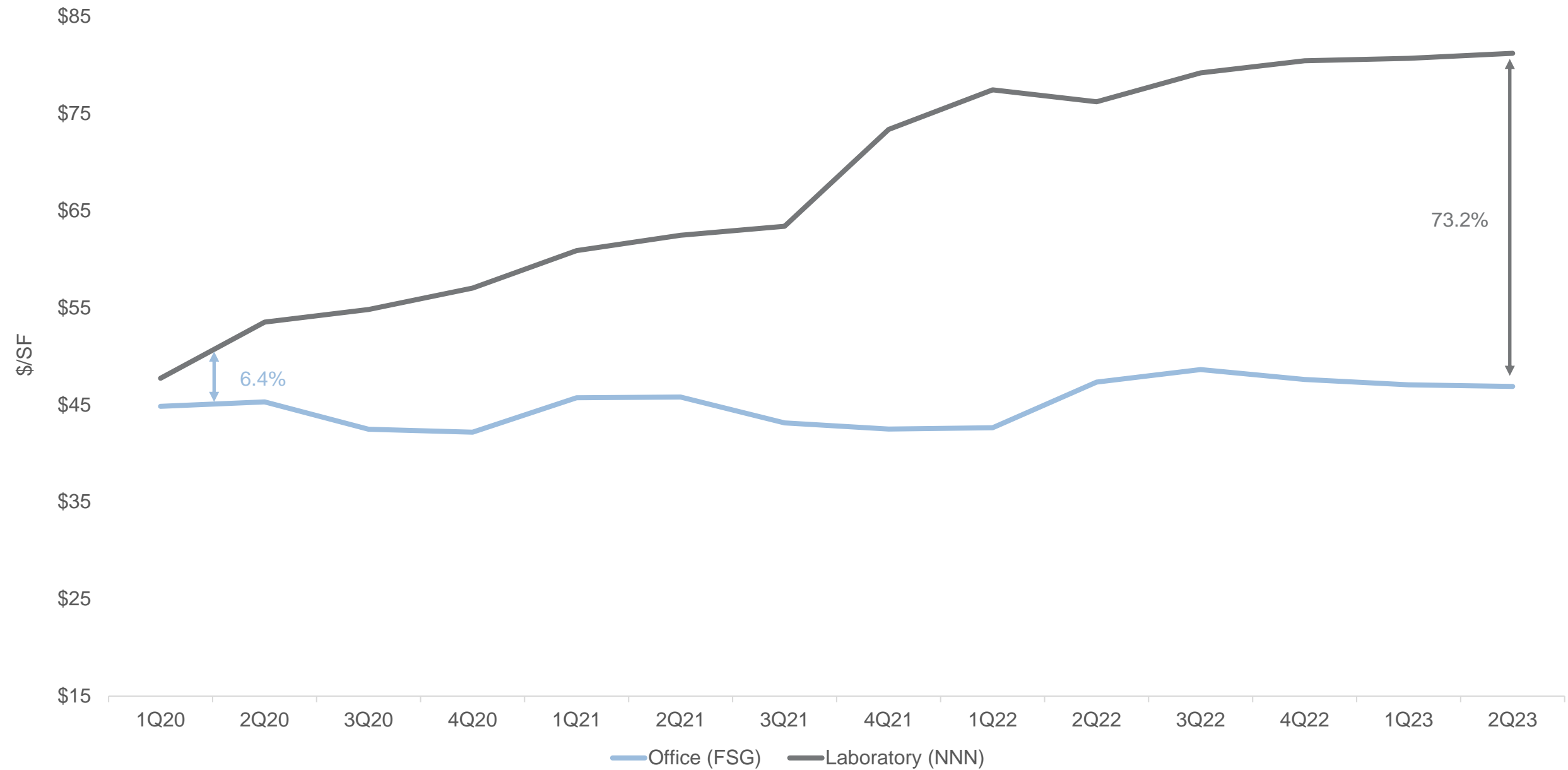


Source: Newmark Research  
\*Only includes data from Boston, Bay Area, San Diego

# Laboratory Landlords Have Benefitted from Strong Fundamentals

Compared to the office market, which continues to face headwinds following the pandemic, laboratory rents have expanded exponentially over the last three years. U.S. office rents increased by roughly 4.6% from 2020 through midyear 2023, falling far behind growth trends among key laboratory markets.

Total Average Asking Rent: Office (FSG)\* and Laboratory (NNN)\*

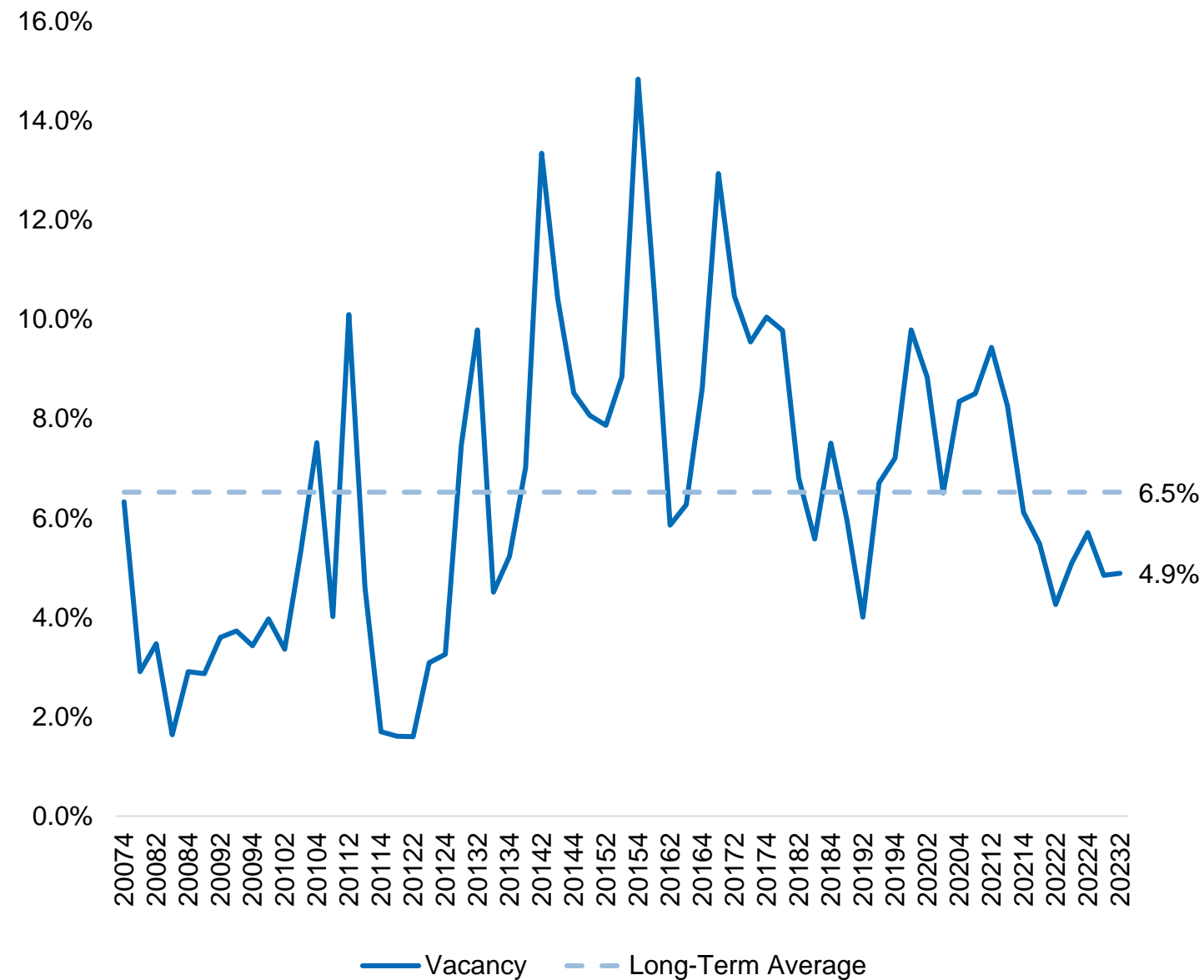


Source: Newmark Research  
\*Only includes data from Boston, Bay Area, San Diego

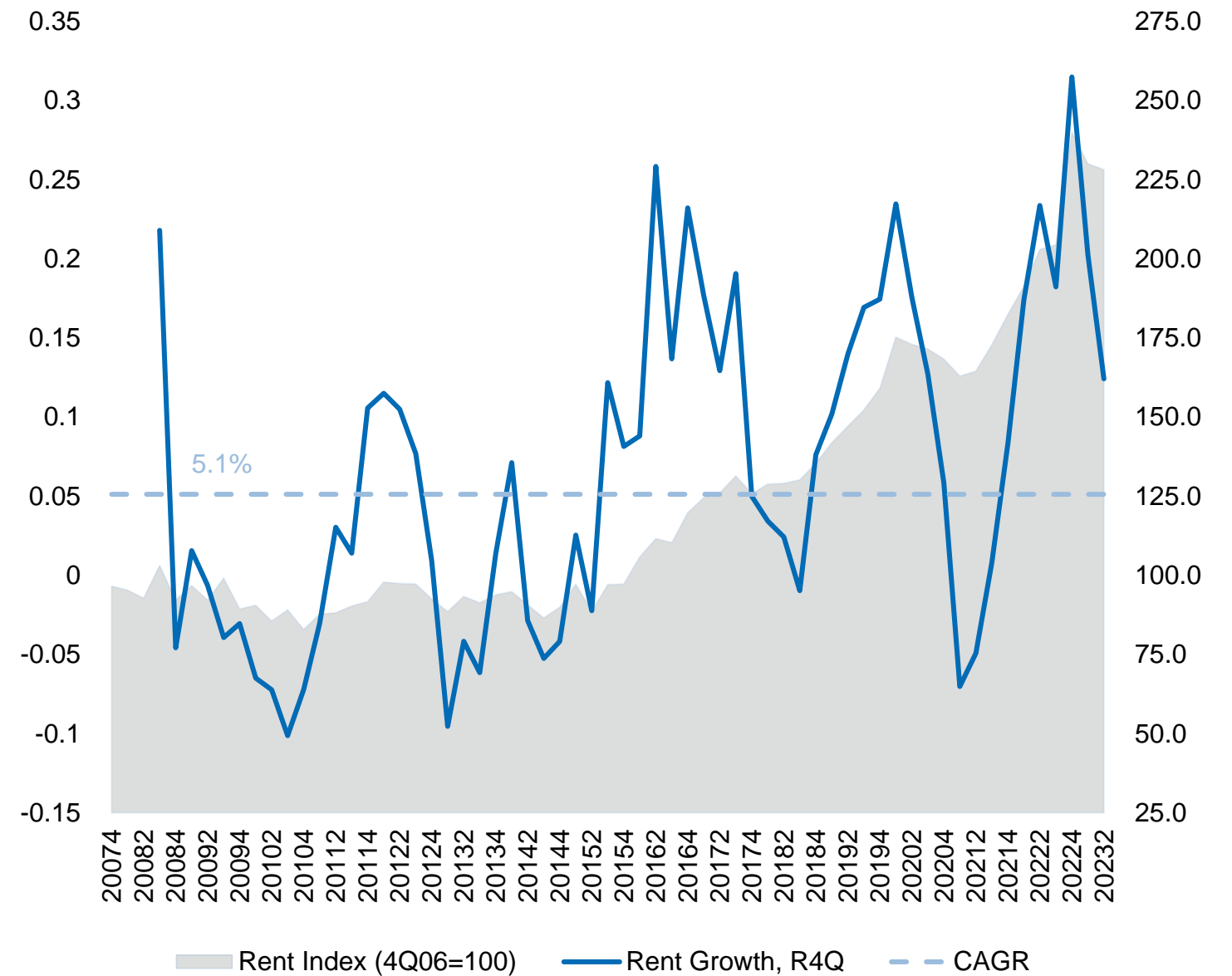
# Institutional Life Science Portfolios Performance Strong but Slowing on the Margin

NCREIF member holdings of life science properties has increased from 7 properties / 1.9 million SF in 2007 to 69 properties / 14.19 million SF in the second quarter of 2023. Much of this increase has occurred since the pandemic. The sample size remains limited, giving rise to significant volatility in both vacancy and rent growth. Even so, it seems clear that life science occupancy has remained healthy at just 4.9%. Reported rent growth has been tremendous in the last several years, though it is now moderating back towards its long-term average.

### NCREIF Life Science Vacancy



### NCREIF Life Science Rent Growth

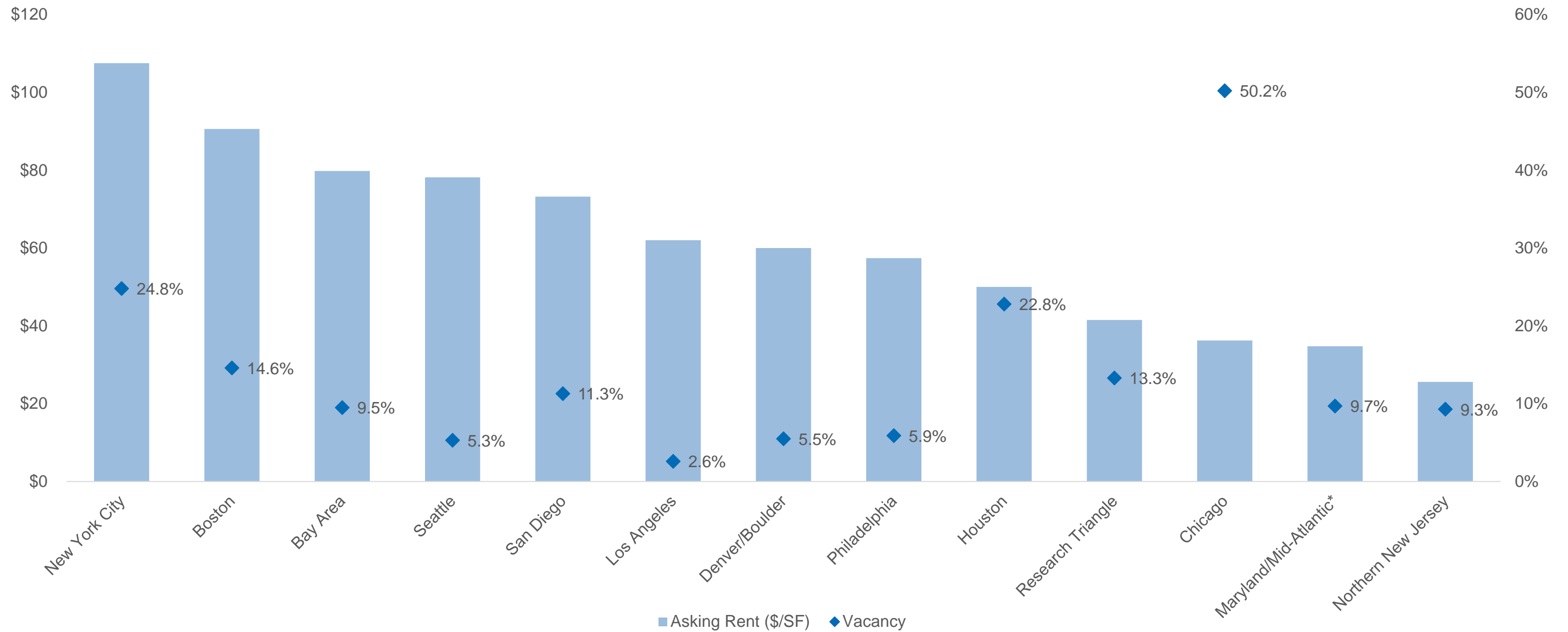


Source: NCREIF, Newmark Research  
 Note: includes both industrial and office life science subtypes

# More Emerging Markets Boast Higher Vacancy Rates

Asking rents for lab space remain highest within New York and Boston, while lease rates are similar in the Bay Area, Seattle and San Diego. Vacancies are among the highest in the smallest life science markets, such as New York, Chicago and Houston.

2022 Vacancy Rate and Average Asking Rent by Market

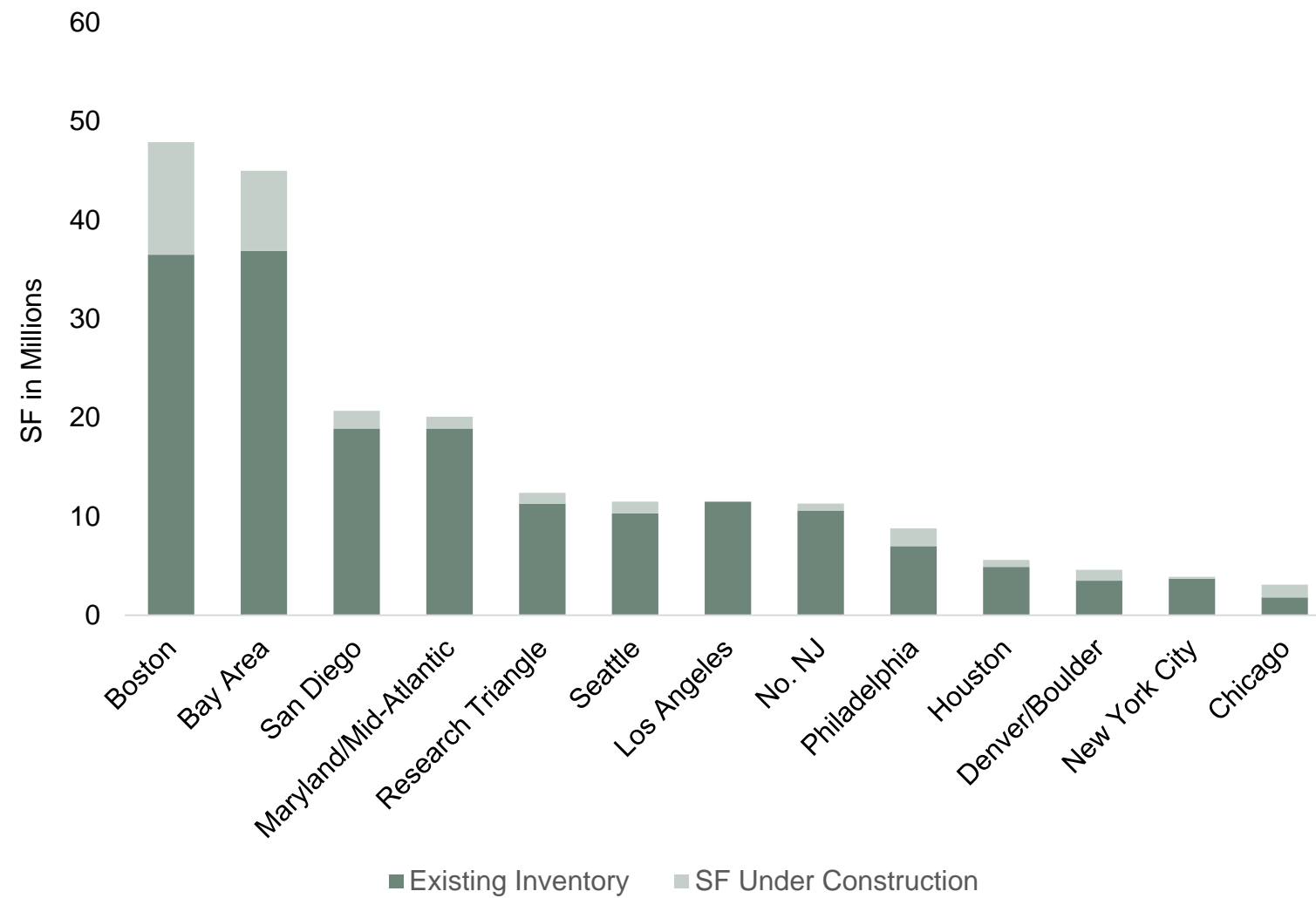


Source: Newmark Research

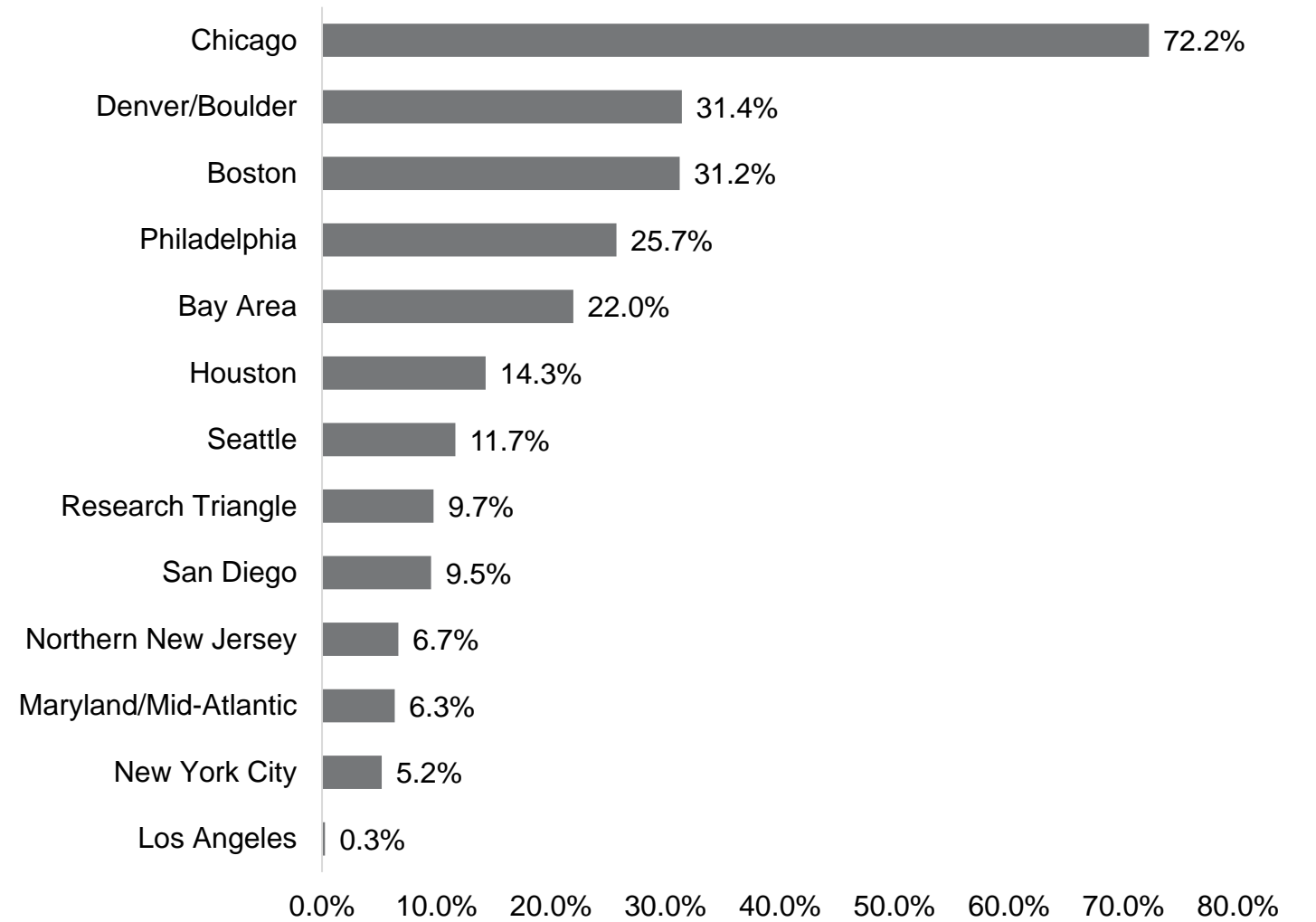
# Developers Remain Focused on Established Clusters

As of the second quarter of 2023, 30.6 million square feet of purpose-built laboratory space was underway within the top 13 life science markets. This represents 17.4% of existing inventory. Boston, the Bay Area and San Diego account for 69.5% of all new construction. New construction in Boston represents more than 31.0% of current inventory, with office-to-lab conversions further expanding the local development pipeline.

Existing Inventory and SF of Purpose-Built Space Under Construction



SF Under Construction a % of Existing Laboratory Inventory

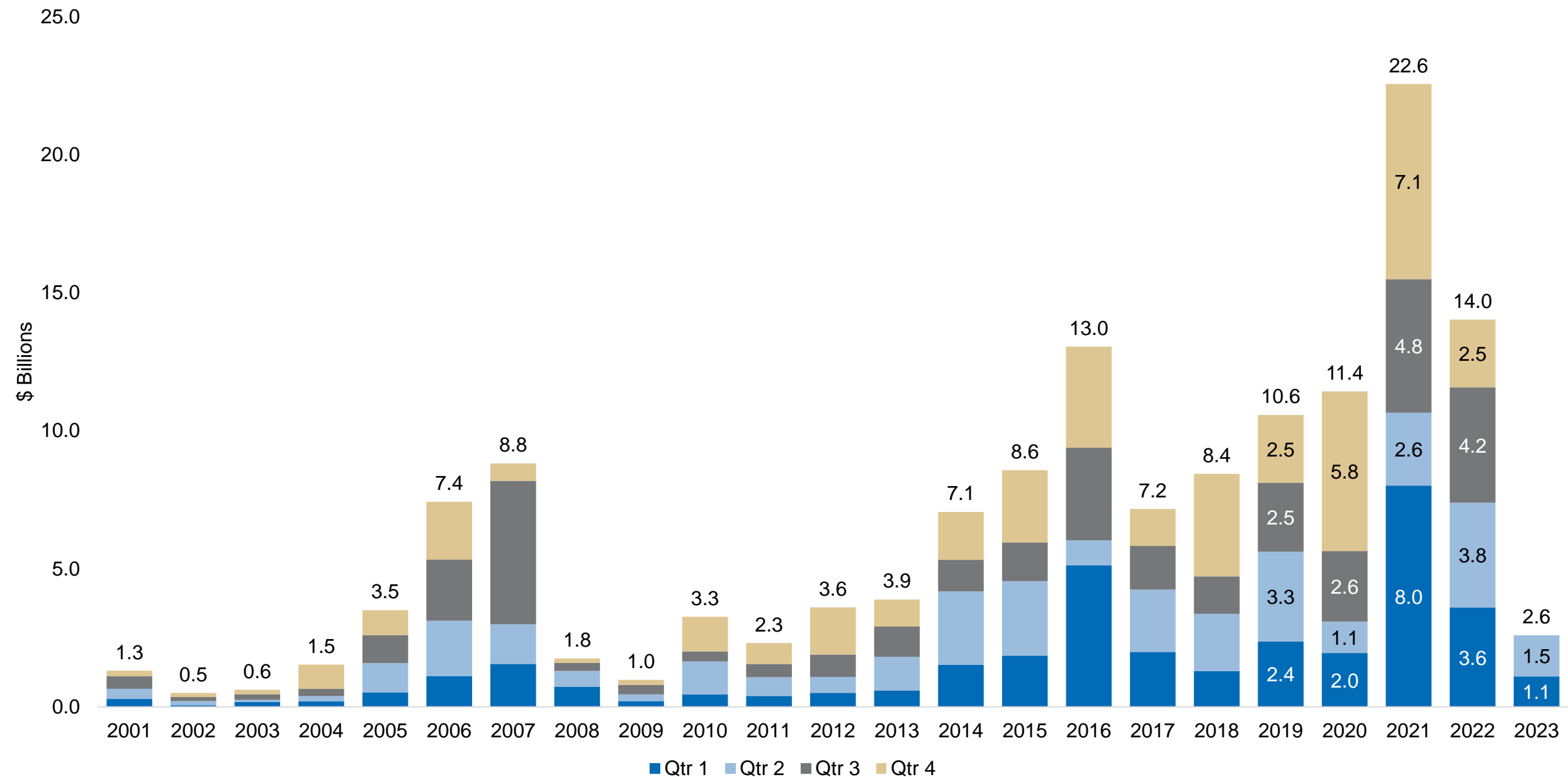


Source: Newmark Research  
Maryland/Mid-Atlantic data as of 4Q 2022

# R&D\* Volumes Declined 65% YoY in 1H23, Down 42% from 2017 to 2019 Average

The R&D/life science sector attracted significant investor interest in 2021, driving sales volume to double the 2020 mark to \$22.6 billion. There was simply not enough product to sustain this pace in early 2022, resulting in slowing activity still well above pre-pandemic levels. By the middle of the year, however, rising interest rates and greater concern about new lab supply in several markets contributed to weakening momentum. This culminated in weak sales in the fourth quarter of 2022, which continued into the first half of 2023.

## R&D Investment Sales

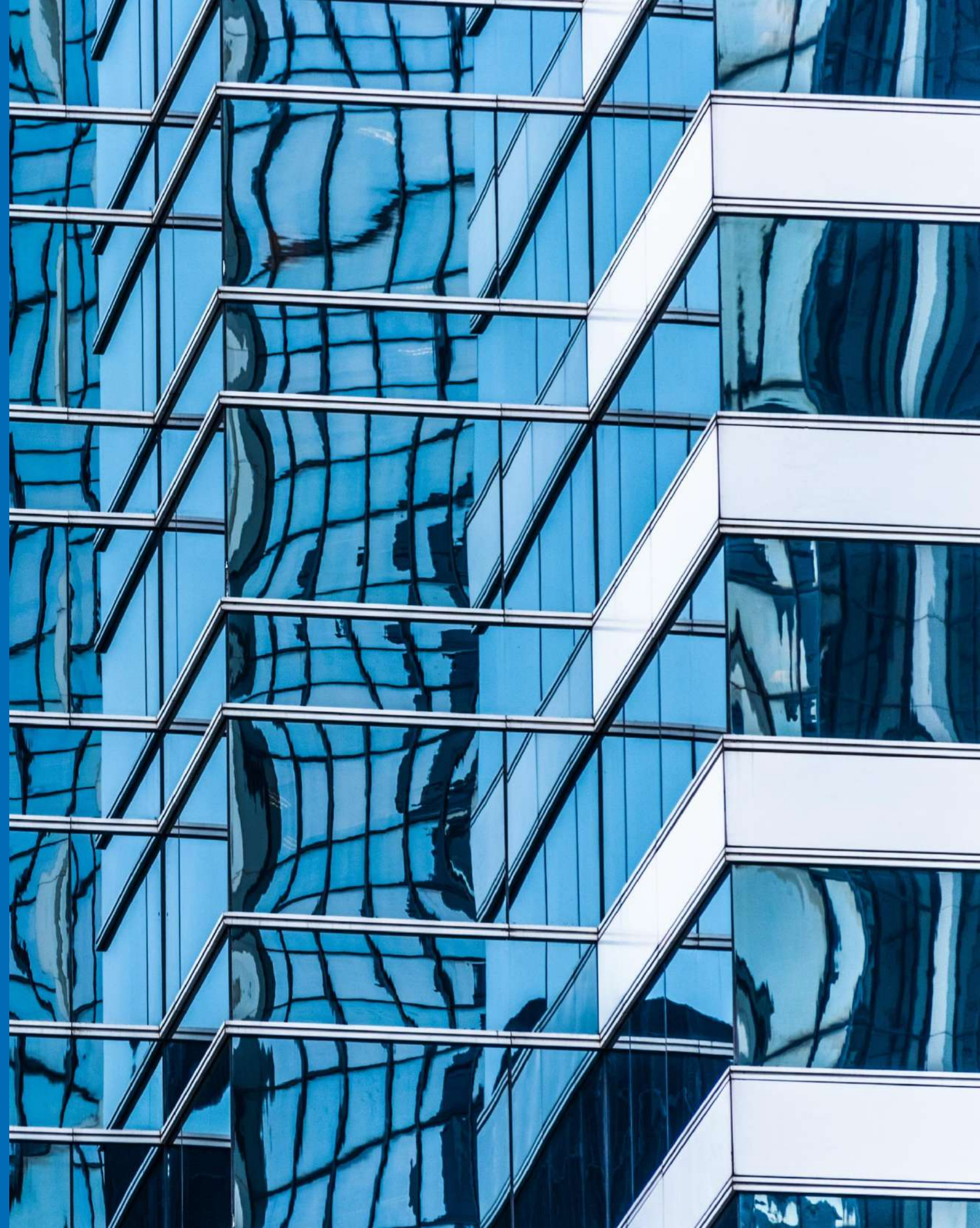


Source: RCA, Newmark Research as of 9/25/2023  
 \*We use the R&D property subtype as a proxy for Life Science

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MIDYEAR 2023 U.S. LIFE SCIENCE MARKET OVERVIEW

# Life Science Capital Markets

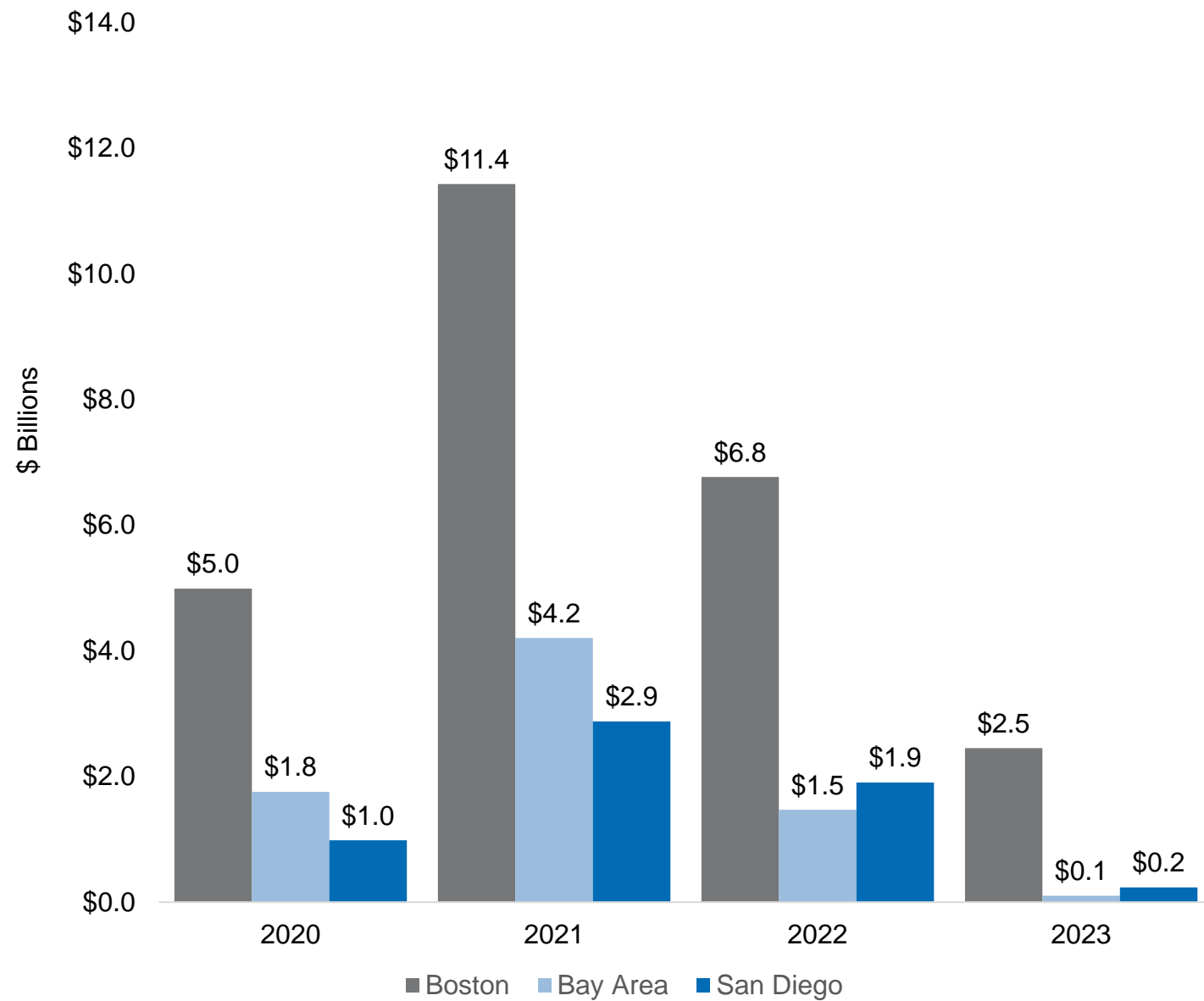




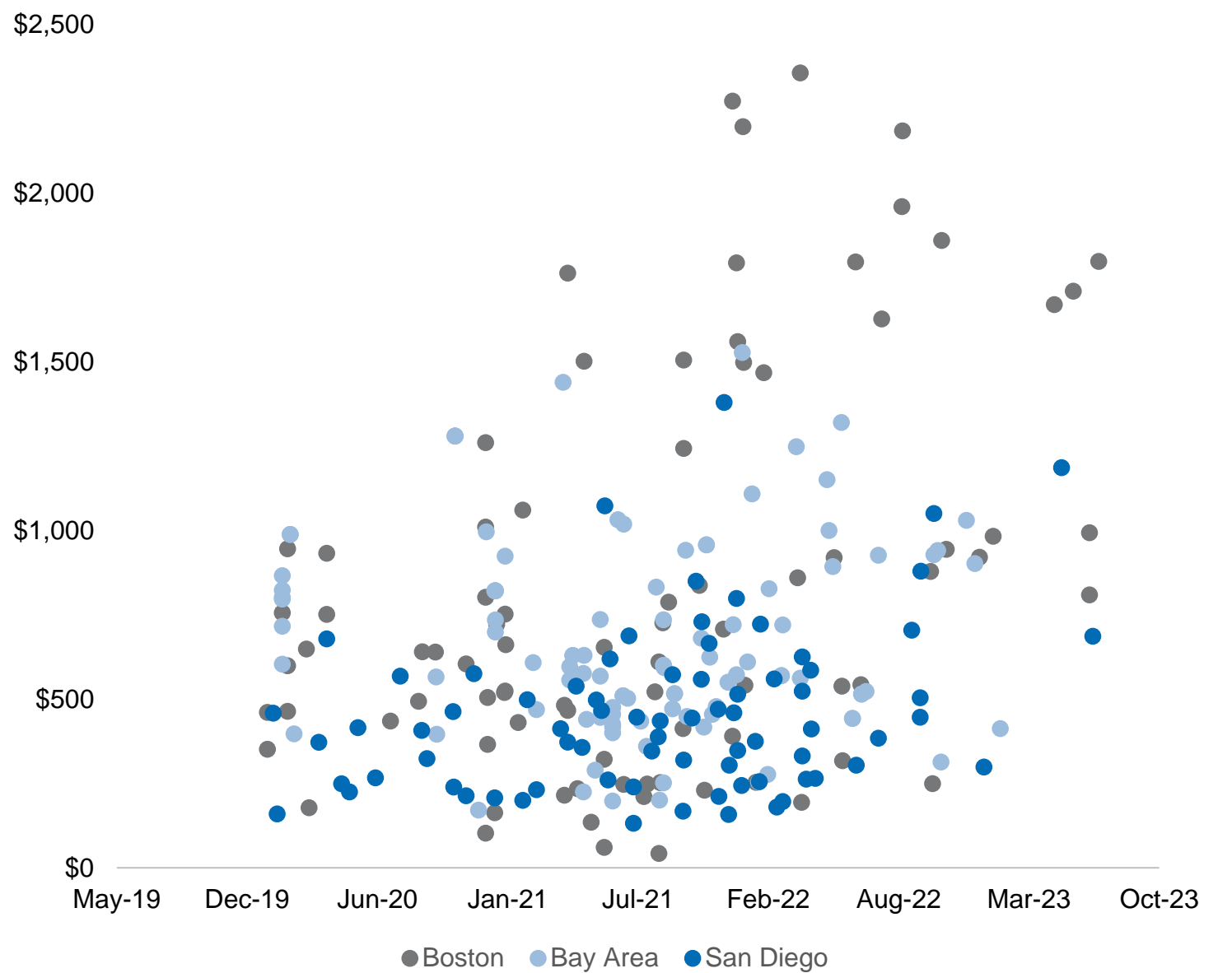
# The Higher Interest Rate Environment is Weighing on Investment Activity

According to proprietary analysis from Newmark, close to \$39.0 billion in life science-related assets changed hands in the nation's top three biotech hubs from 2020 through mid-year 2023, with 2021 representing the height of activity. Boston accounted for more than 65.0% of the investment sales during this period. Sales volumes began to wane in 2022 and have remained muted during the first half of 2023. In the Bay Area, conversions accounted for 73.0% of the total investment sales, while only 26.0% of Boston sales were conversions.

**Total Life Science-Related Investment Sales: Top 3 Markets**



**\$/SF of Life Science Sale Transactions: Top 3 Markets**

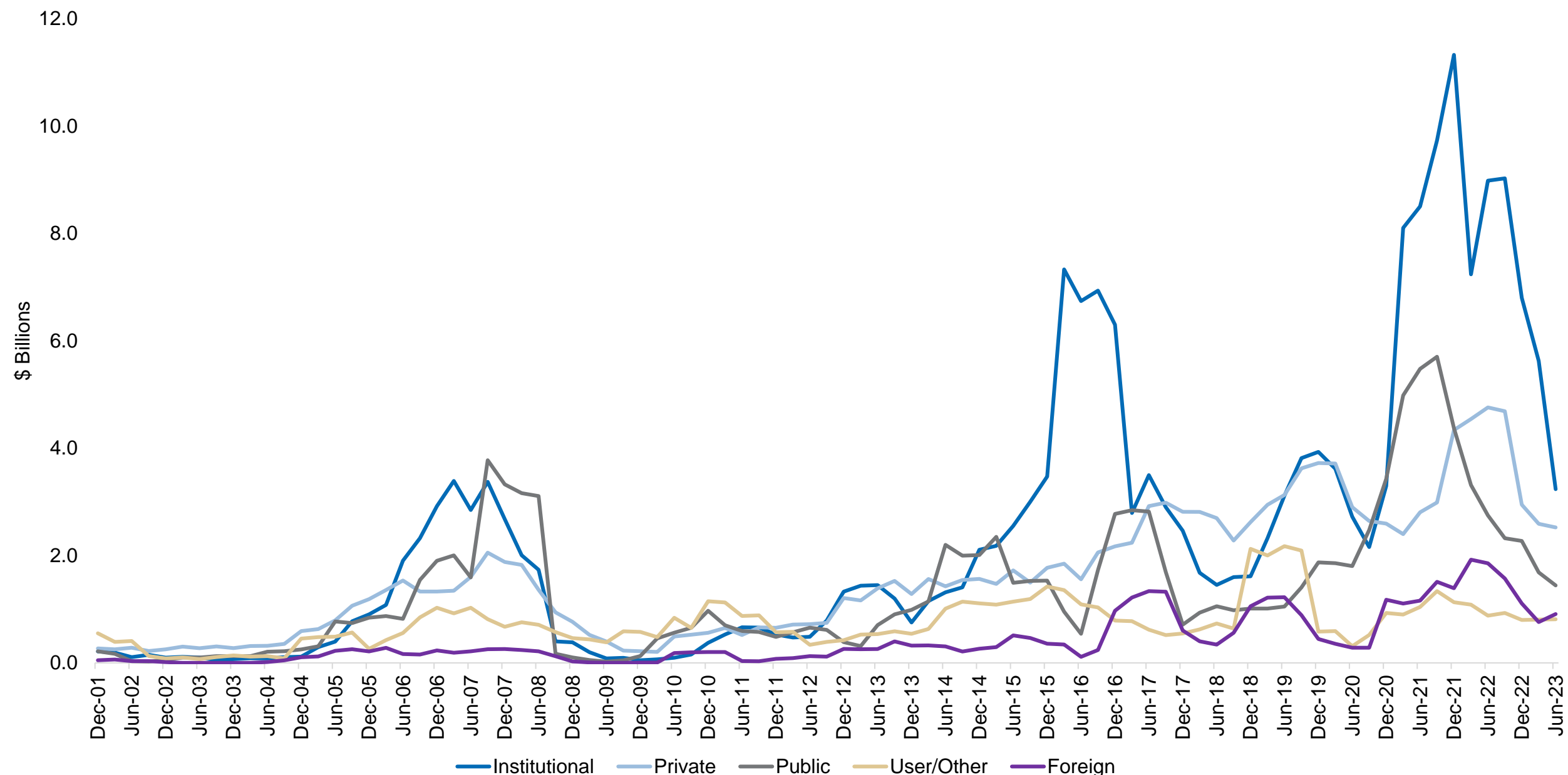


Source: Real Capital Analytics, Newmark Research

# Acquisitions Have Declined across Investor Groups in Recent Quarters

Institutional investors and REITs drove the market to its recent peaks, though private and foreign investors also contributed. By equal measure, institutional investors and REITs have also driven the market to its current quiescence with institutional and REIT acquisitions down 88% and 80% year-over-year, respectively in the first half of 2023. Despite the sudden decline, the institutional share of acquisitions remains elevated in the last 12 months at 35%, down from a peak of 50% in 2021 as compared to a long-term average of 28%.

R&D\* Acquisition Volume, Rolling 4-Quarter



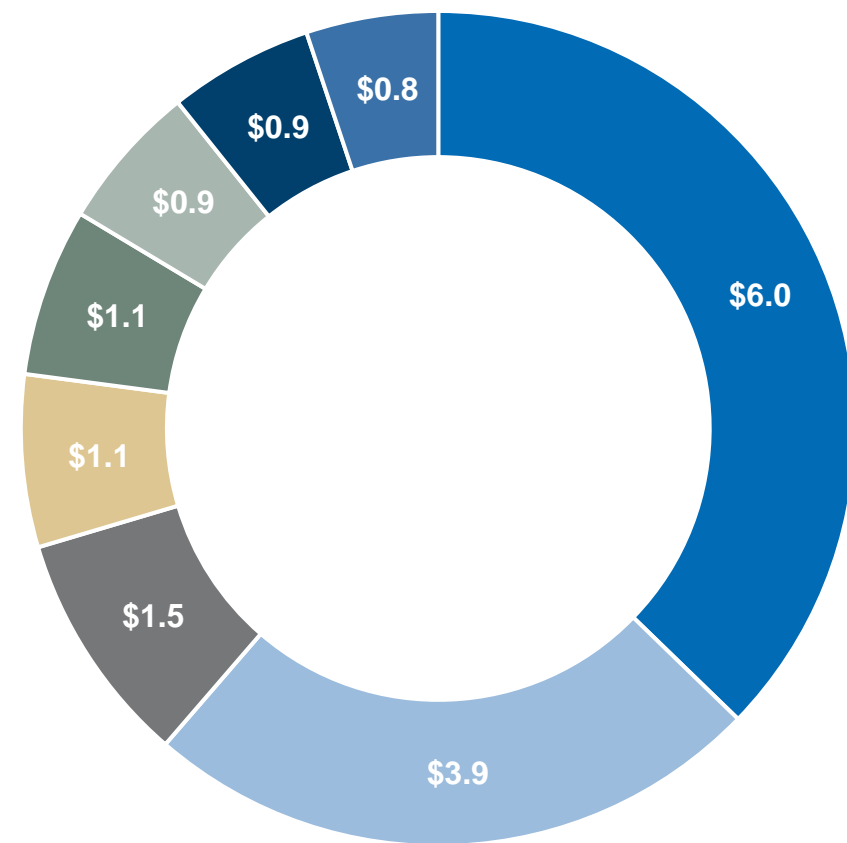
Source: RCA, Newmark Research as of 9/25/2023  
 \*We use the R&D property subtype as a proxy for Life Science

# Top Life Science Owners Dominate Acquisitions in Key Markets

Top existing owners of life science-related commercial real estate continue to find investment opportunities within the top three U.S. markets. From 2020 through midyear 2023, top owners represent half of all acquisitions. With that, life science owners have begun to divest non-core assets as market conditions remain precarious.

## Life Science Investments from Select Top Owners: Boston, Bay Area, San Diego

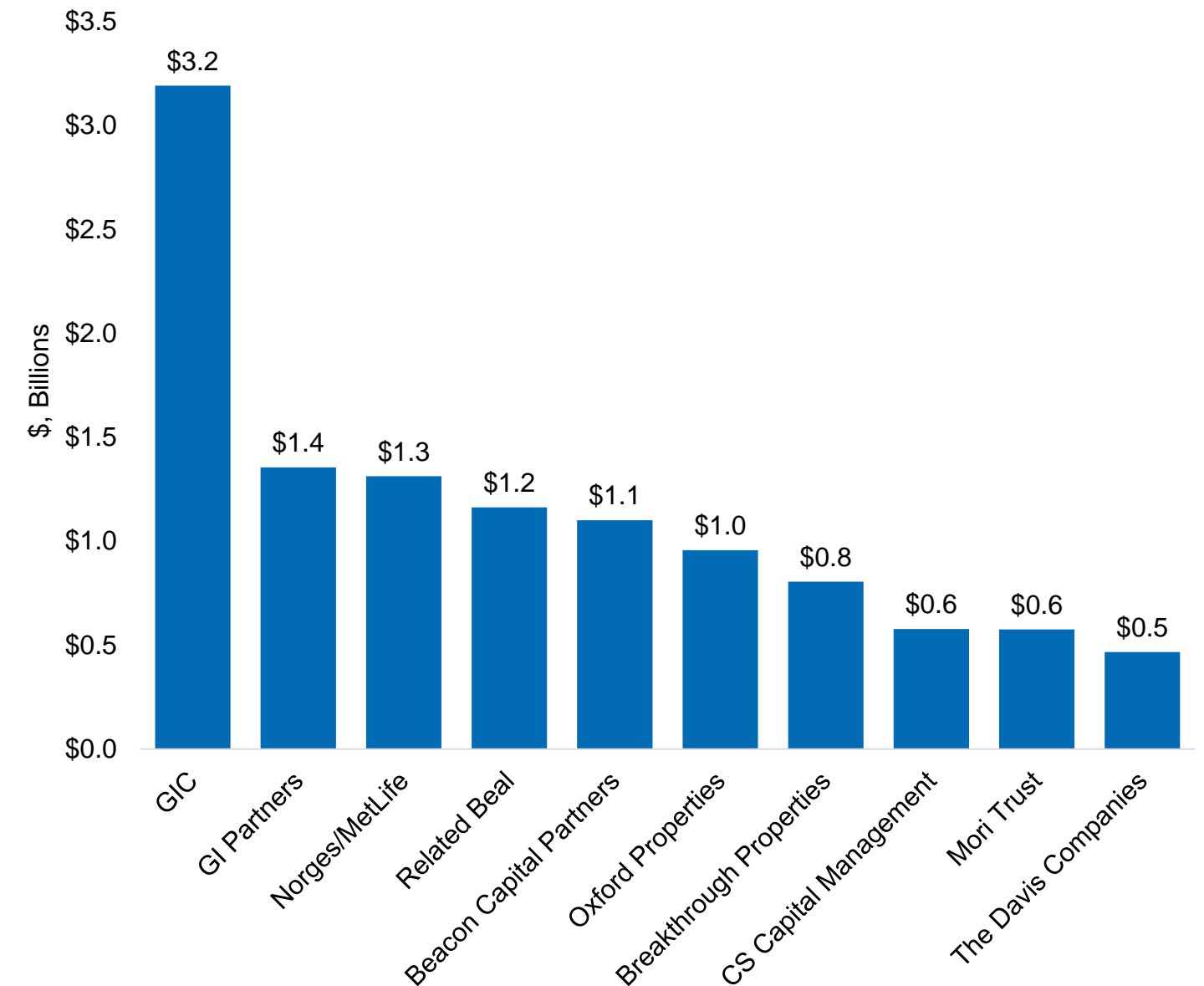
\*2020-2Q2023 Transactions



- Alexandria Real Estate Equities
- Blackstone BioMed
- Alloy Properties/TPG
- Ventas
- Longfellow Real Estate Partners
- Healthpeak Properties
- IQHQ
- Harrison Street

## Non-Top Owner Life Science Investment: Boston, Bay Area, San Diego

2020-2Q2023 Transactions

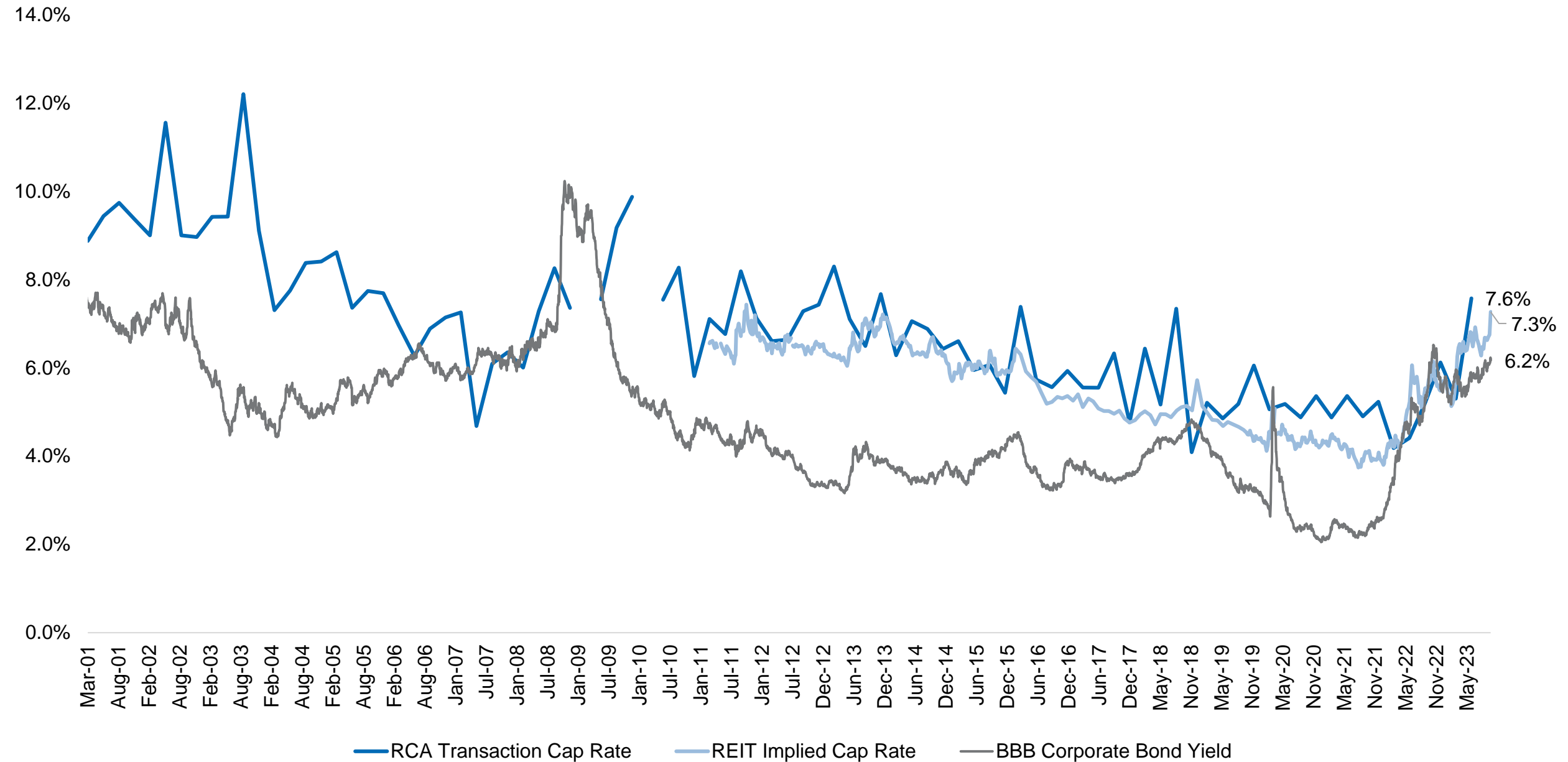


Source: Real Capital Analytics, Newmark Research

# Life Science Cap Rates Have Risen Significantly along with Rates

The spread to BBB corporate bond yields, a proxy for the cost of low leverage, fixed-rate debt, is modestly positive but extremely tight compared to historical averages. This will continue to place upward pressure on cap rates in public and private markets.

## R&D\* / Life Science Cap Rates

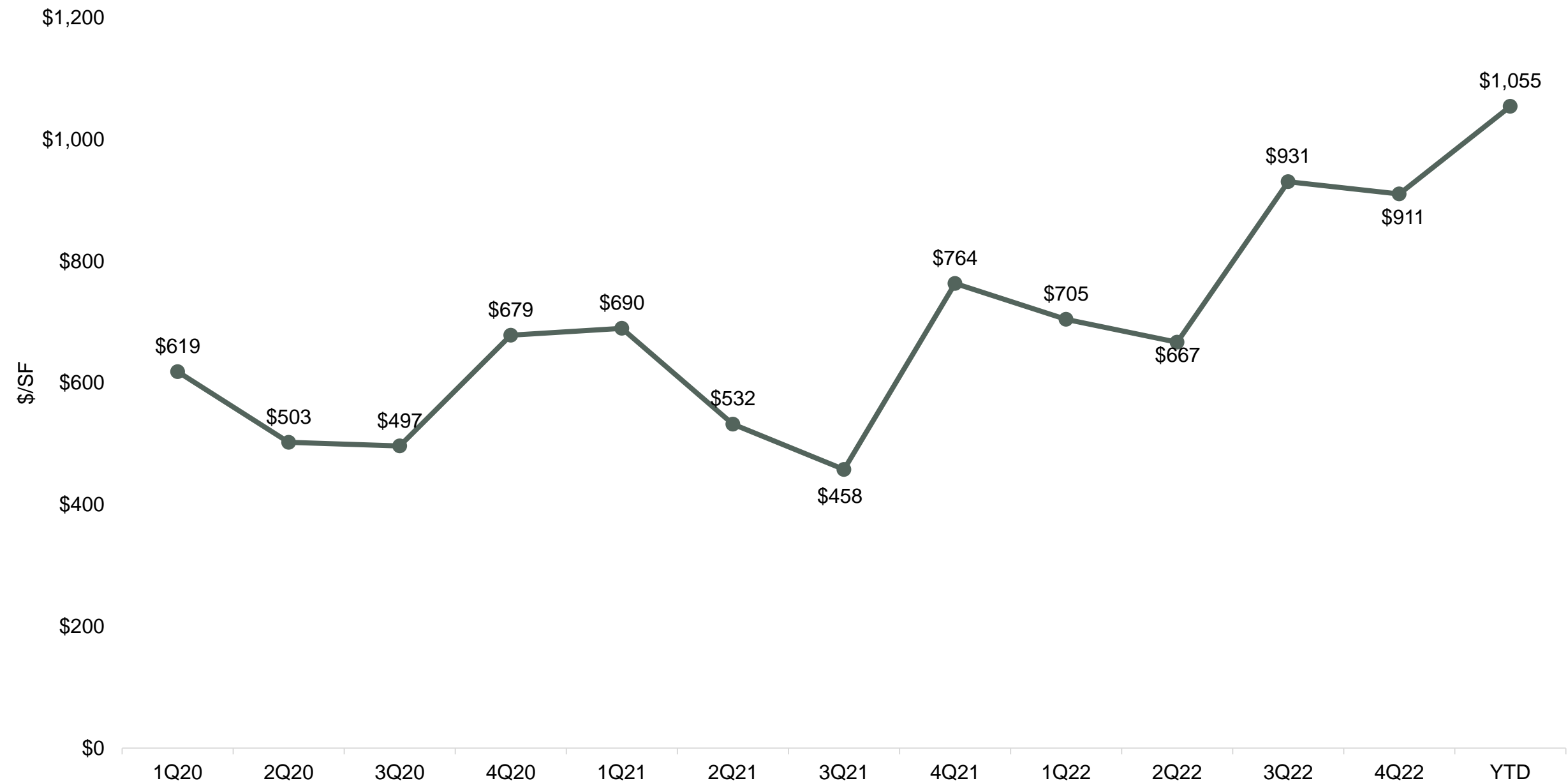


Source: RCA, Green Street, Ice Data Indices, LLC, Newmark Research as of 9/25/2023  
 \*We use the R&D property subtype as a proxy for Life Science

# The Lack of Transaction Volume is Limiting Price Discovery

On average, the price per square foot for life science-related assets increased by 34.2% from the end of 2020 to 2022 in the nation's top three clusters, with the third quarter of 2022 marking peak per-square-foot pricing. A more difficult investment landscape has resulted in a lack of clarity in pricing declines for life science-related assets. Select sale transactions of well-leased life science assets drove up per-square-foot pricing during the second quarter of 2023.

Quarterly Average \$/SF of Life Science Investment Sales: Boston, Bay Area, San Diego

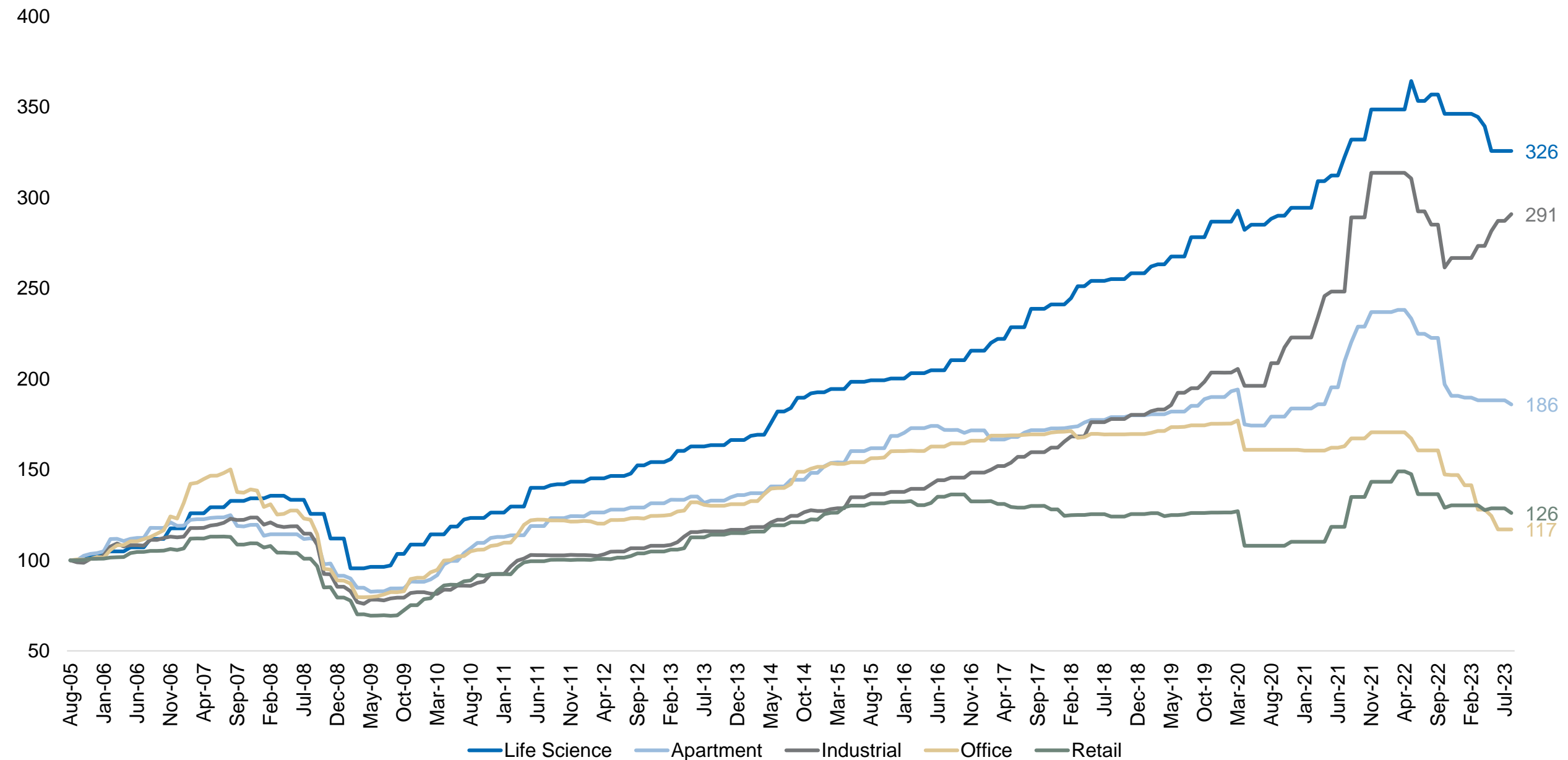


Source: Real Capital Analytics, Newmark Research

# Life Science Has Outperformed All Other Property Types since 2008

From 2019 to the post-pandemic peak, life science outperformed all sectors, with the exception of industrial; up 27.1% compared with 54.1% for industrial. Life science values are now down 10.6% from the peak, which is a better showing compared with all other property types save industrial. The recent surge in industrial prices is hard to believe, so the true comparative performance could be even more closely matched. Meanwhile, life science has unambiguously outperformed apartment, retail and office properties.

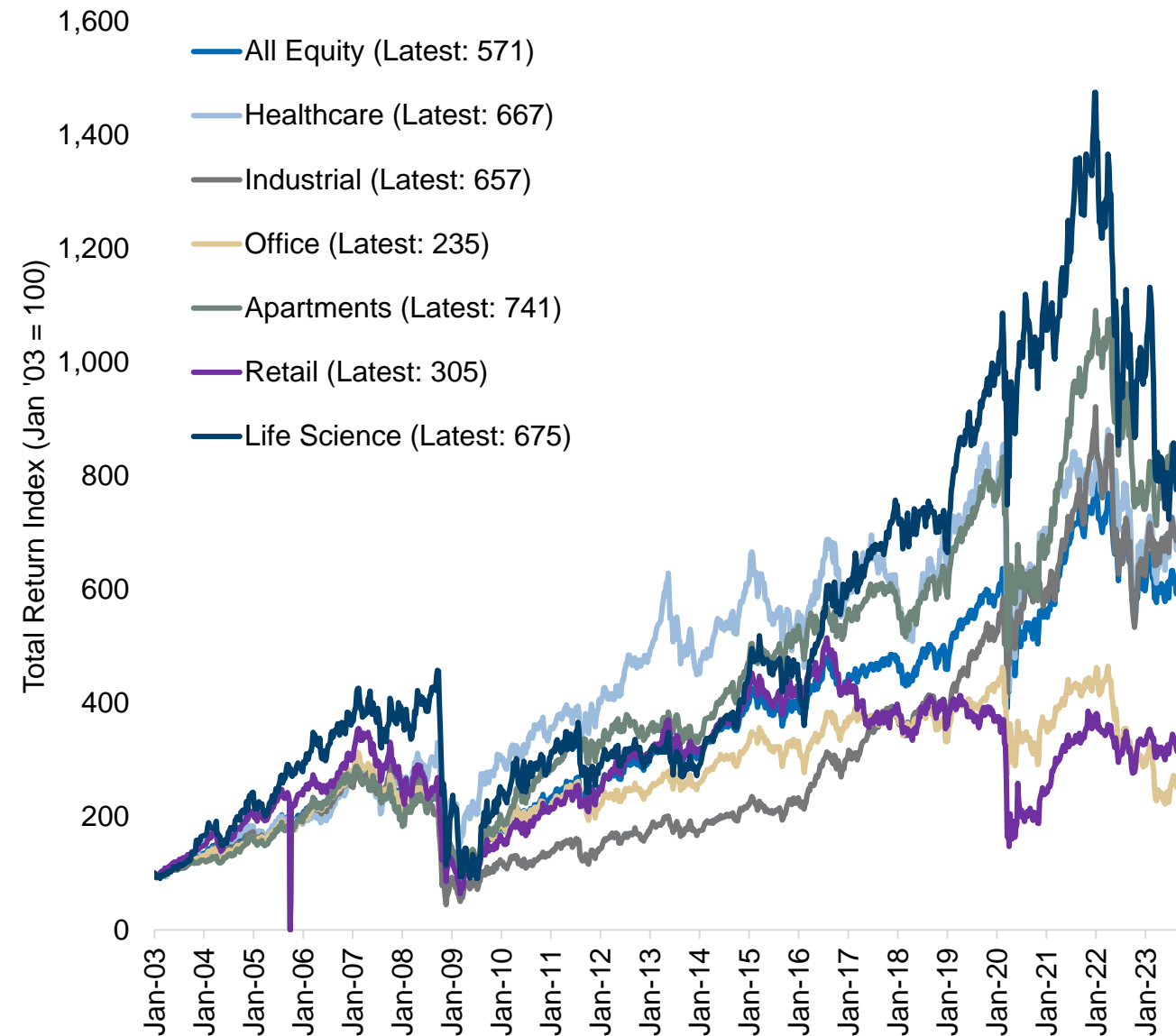
Green Street Commercial Property Price Index (Aug 2005 = 100)



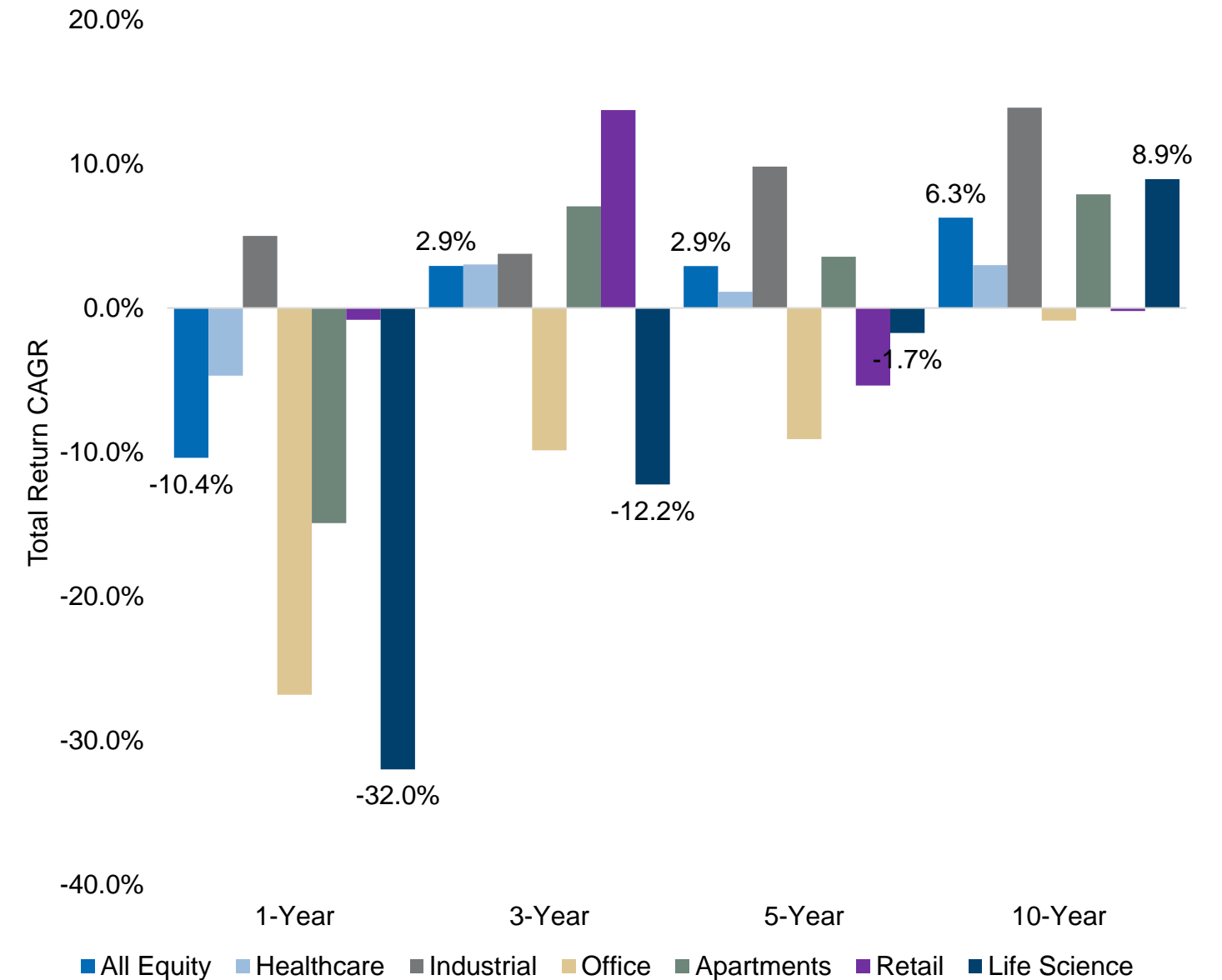
# Life Science REITs Have Produced Long-Term Performance Despite Recent Sell-Off

The life science sector delivered significant outperformance before peaking in December 2021. Since then, the sector has underperformed owing to a combination of high interest rate risk stemming from extreme valuation (low cap rates) and investor concern around rising supply, market concentration and the implosion of VC finance.

## Life Science Has Outperformed All Other Sectors Since 2003



## Life Science Underperformed Dramatically in LTM Following Pandemic Run-Up

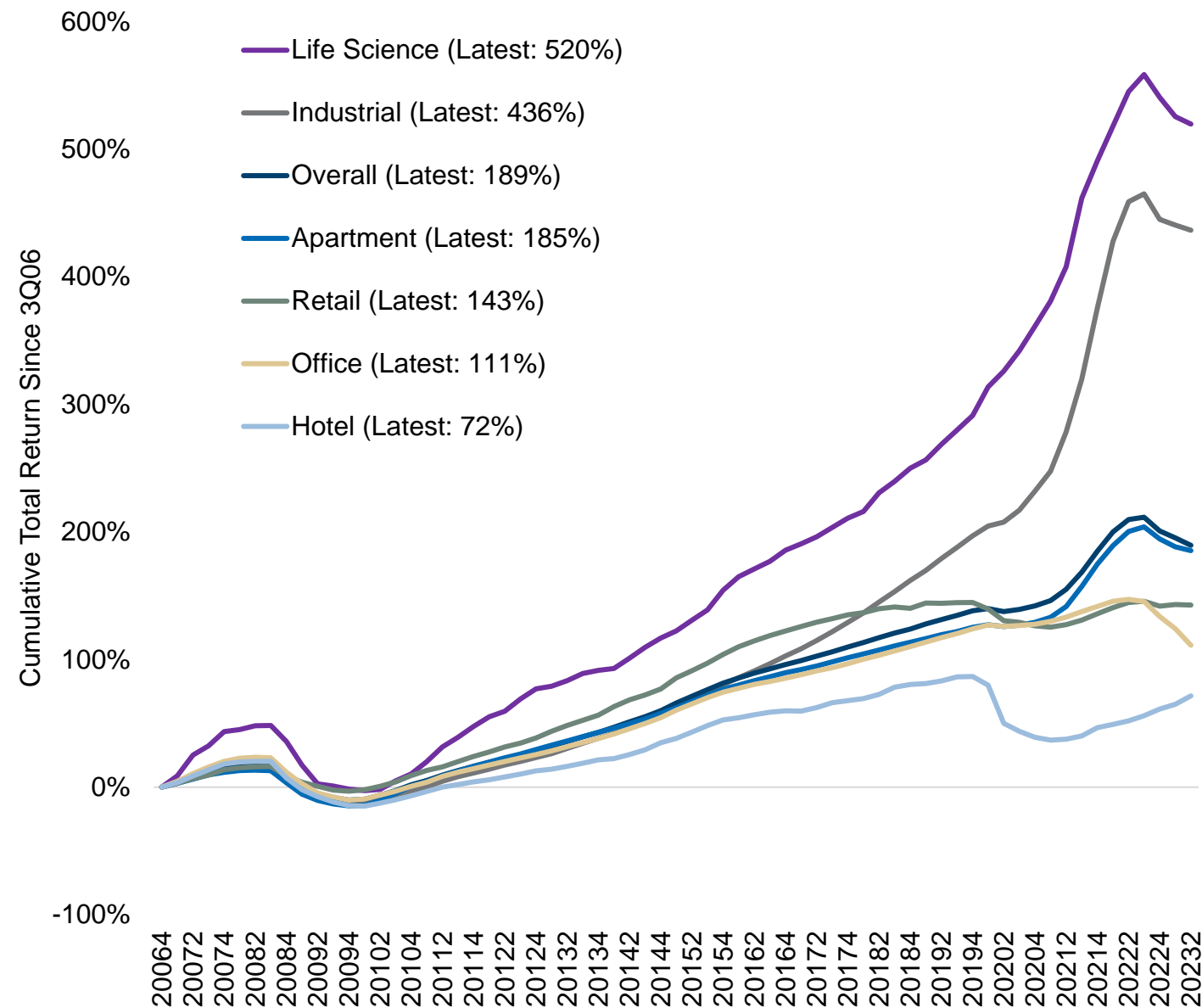


Source: S&P Capital IQ, S&P Dow Jones Indices LLC; Moody's Analytics Calculated, Newmark Research as of 9/25/2023

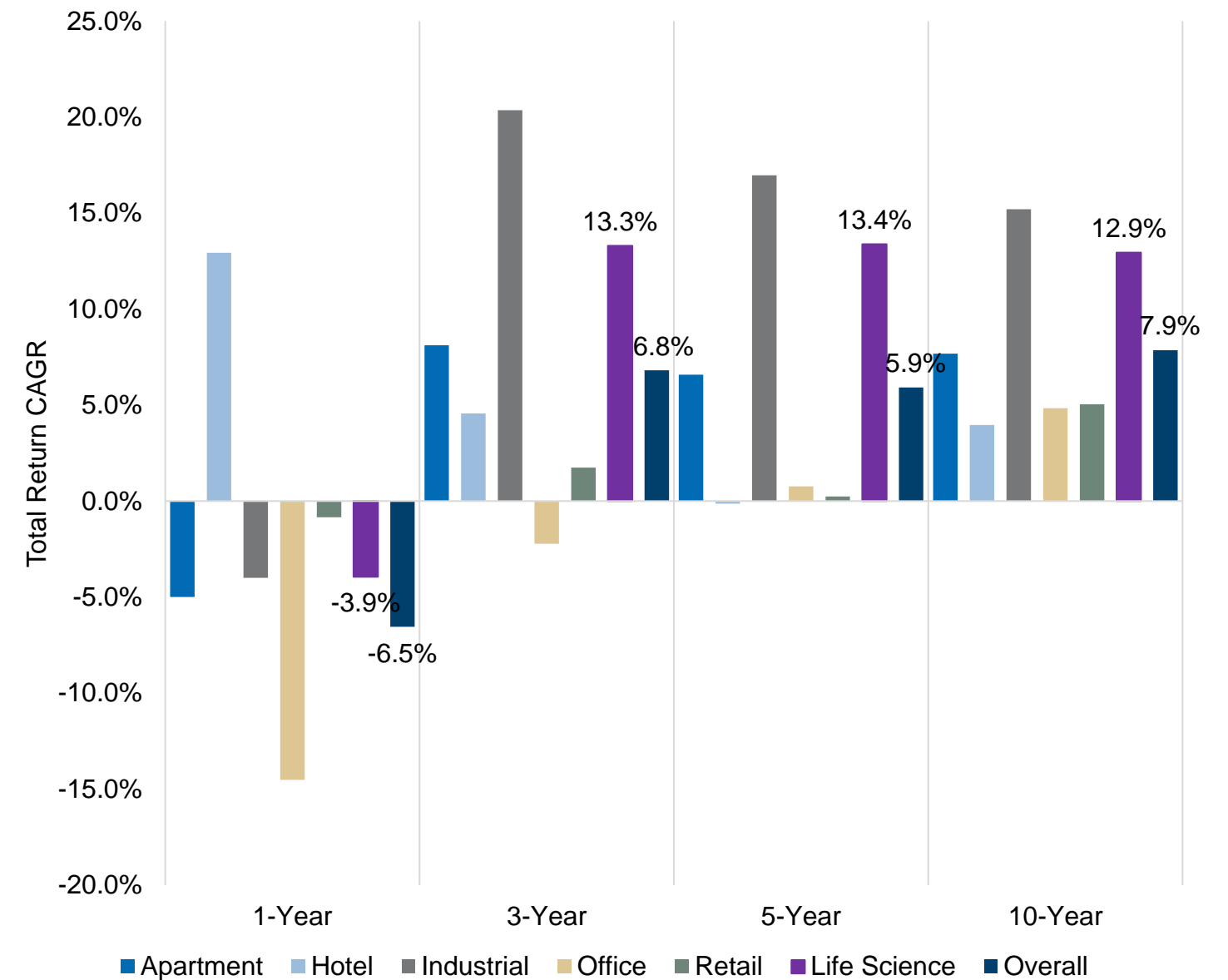
# Private Market Returns Second Only to Industrial Over Last 10 Years

Life science has generated negative total returns in the last two quarters, like all other sectors save hotels. Public markets suggest that this negative performance will continue as cap rates continue to adjust. Strong operating fundamentals will continue to support values, but it is worth noting that this failed to preserve public market values.

## NCREIF Life Science Sector Has Outperformed All Other Since 2006



## Only Industrial Has Outperformed in Last 10 Years, Returns Softened in TTM



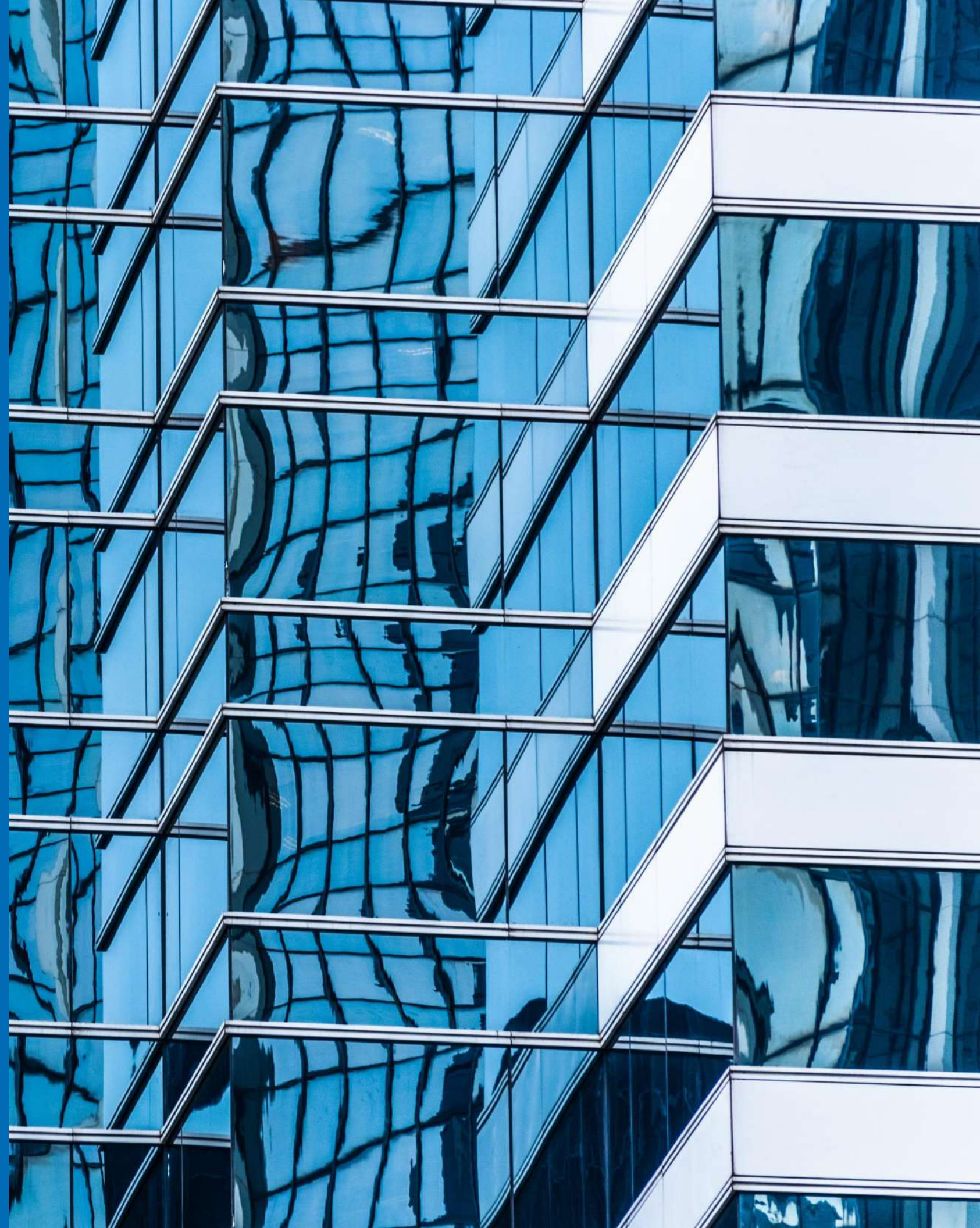
Source: NCREIF, Newmark Research



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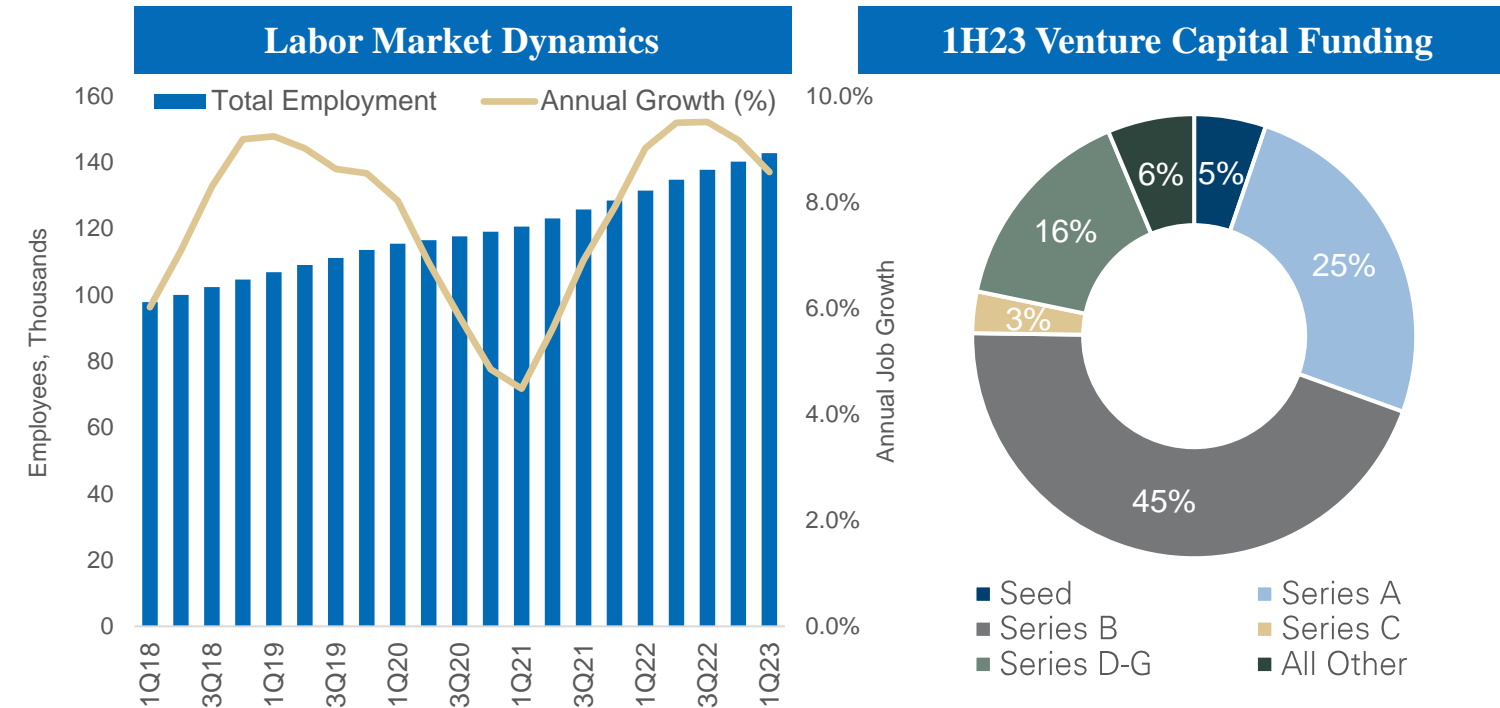
MIDYEAR 2023 U.S. LIFE SCIENCE MARKET OVERVIEW

# Market Profiles



# Boston

- Leasing velocity slowed considerably during the second quarter of 2023, totaling less than 1/3 of activity recorded in the previous quarter, and tenant requirements have fallen below 2.0 million square feet.
- Roughly 2.9 million square feet of converted and purpose-built laboratory product came on line during the first half of 2023. Greater Boston's inventory is nearing 37.0 million square feet.
- New supply, coupled with softer demand, resulted in a 340-basis-point increase in metrowide vacancies during the second quarter of 2023.



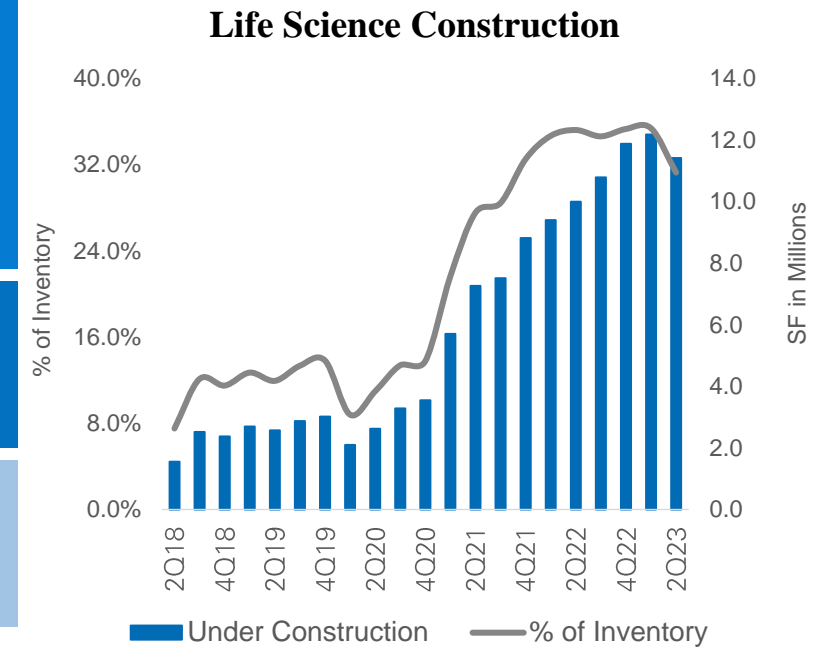
**36.5M SF**  
Total Inventory

**11.4M SF**  
Under Construction

**\$90.58**  
Total NNN Asking Rent

**851K SF**  
YTD Absorption

**14.6%**  
Vacancy



**Top Owners**

Company	Total Square Feet	Percentage of Market Share
Alexandria Real Estate Equities	7.0M SF	19.1%
Blackstone/BioMed	5.4M SF	14.8%
DivcoWest	1.8M SF	4.9%

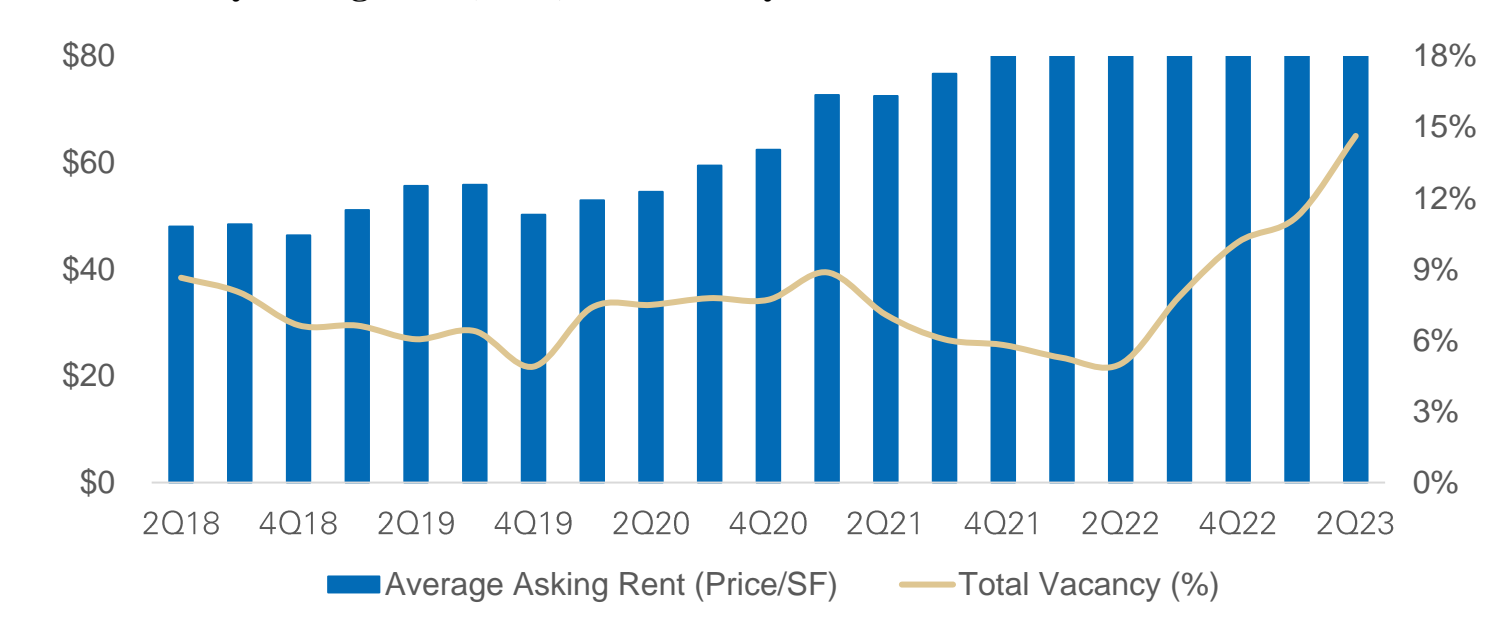
## Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
Novartis Institutes for BioMedical Research	700 Main St, Cambridge	East Cambridge	Lease Extension	99,883
PROMETRIKA	100 CambridgePark Dr, Cambridge	West Cambridge	Lease Extension	15,927
Mercy Bioanalytics	880 Winter St, Waltham	West – Route 128	Direct Lease	13,993

## Select Sale Transactions

Building / Address	Submarket	Sale Price	Price/SF	Square Feet
316 Northern Ave, Boston	Boston – Seaport	\$453.0M	\$1,709	265,000
225, 226, 227 Second Ave, Waltham	West – Route 128	\$266.0M	\$809	328,757
780 & 790 Memorial Dr, Cambridge	Mid Cambridge	\$99.0M	\$993	99,658

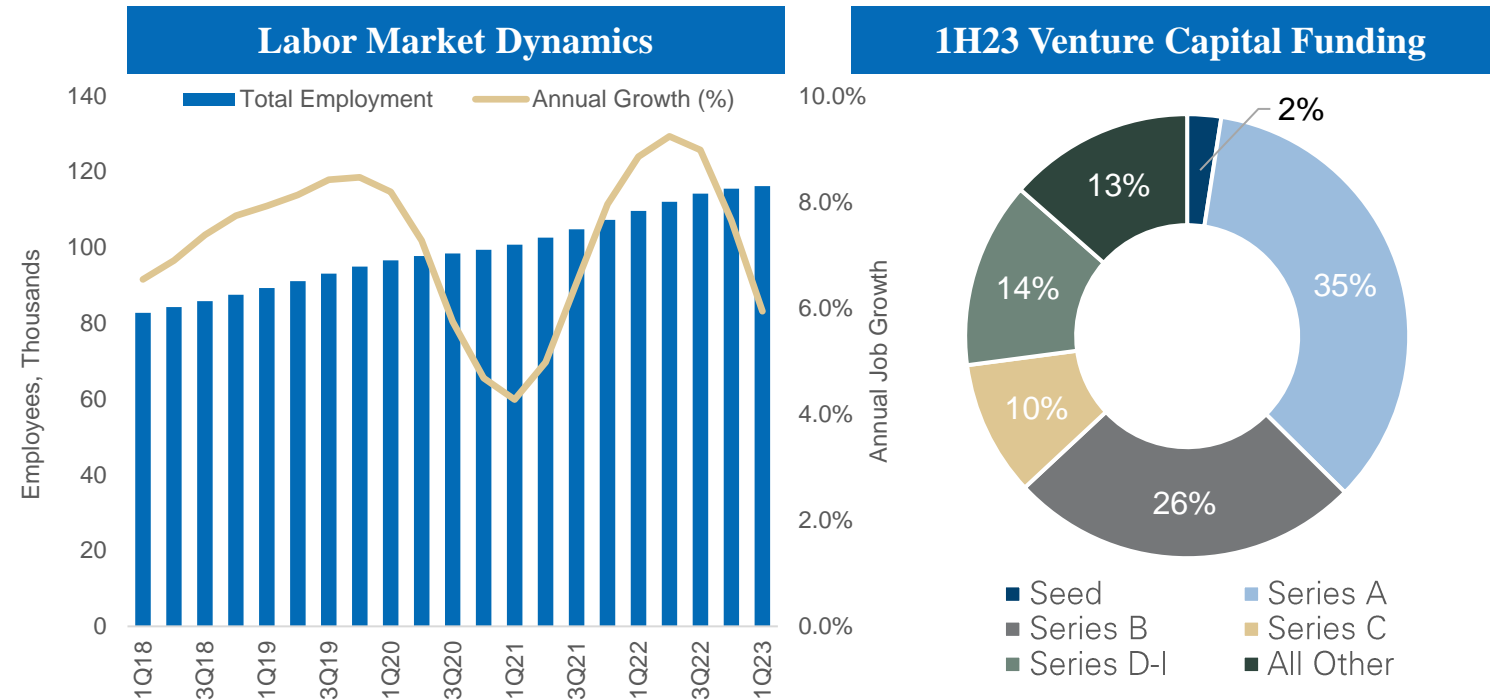
## Laboratory Asking Rent (NNN) and Vacancy



Sources: JobsEQ, Pitchbook, RCA, Newmark Research

# San Francisco Bay Area

- The total volume of under-construction product in the Bay Area market continued to increase in the first half of 2023 and was recorded at 8.1 million square feet, with 8.9% of that under-construction figure already preleased.
- Demand for life science product was recorded at 3.3 million square feet to close out the first half of 2023.
- Funding geared towards life science throughout the Bay Area has decreased for five consecutive quarters. The pullback in funding and continued emphasis on both capital preservation and profitability has meant numerous companies continue to be meticulous in terms of expanding their real estate footprints.



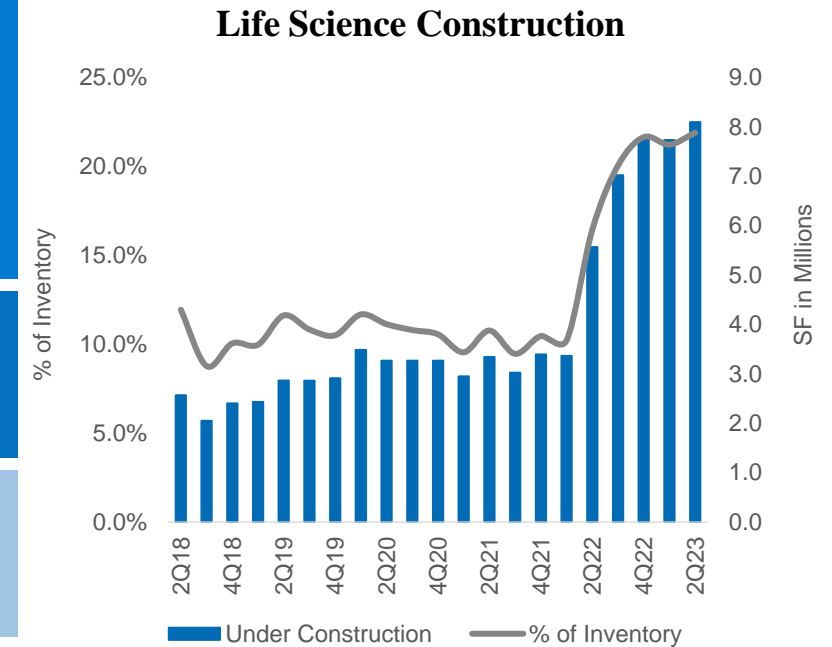
**36.9M SF**  
Total Inventory

**8.1M SF**  
Under Construction

**\$79.80**  
Total NNN Asking Rent

**-863K SF**  
YTD Absorption

**13.0%**  
Availability



**Top Owners**

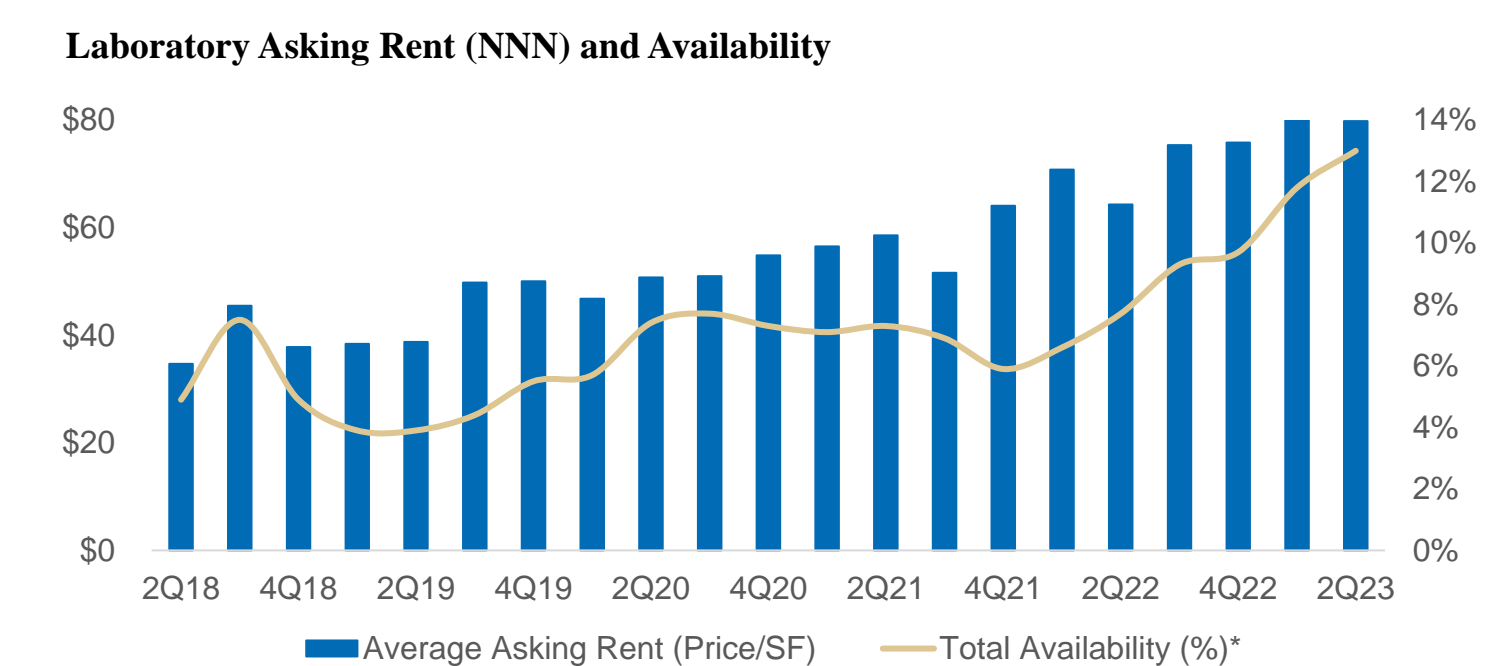
Company	Total Square Feet	Percentage of Market Share
Alexandria Real Estate Equities	4.8M SF	13.4%
Healthpeak Properties	4.7M SF	13.1%
Blackstone/BioMed	4.5M SF	12.5%

**Select Lease Transactions**

Tenant	Building / Address	Submarket	Type	Square Feet
Lawrence Berkeley National Laboratory	5885 Hollis St, Emeryville	Emeryville	Lease Renewal	63,507
Ideaya Bioscience	5000 Shoreline Ct, San Francisco	South San Francisco	Direct Lease	43,966
Verge Genomics	131 Oyster Point Blvd, San Francisco	South San Francisco	Sublease	34,988

**Select Sale Transactions**

Building / Address	Submarket	Sale Price	Price/SF	Square Feet
959 & 999 Skyway Rd, San Carlos	San Carlos – Other	\$102.0M	\$413	246,997

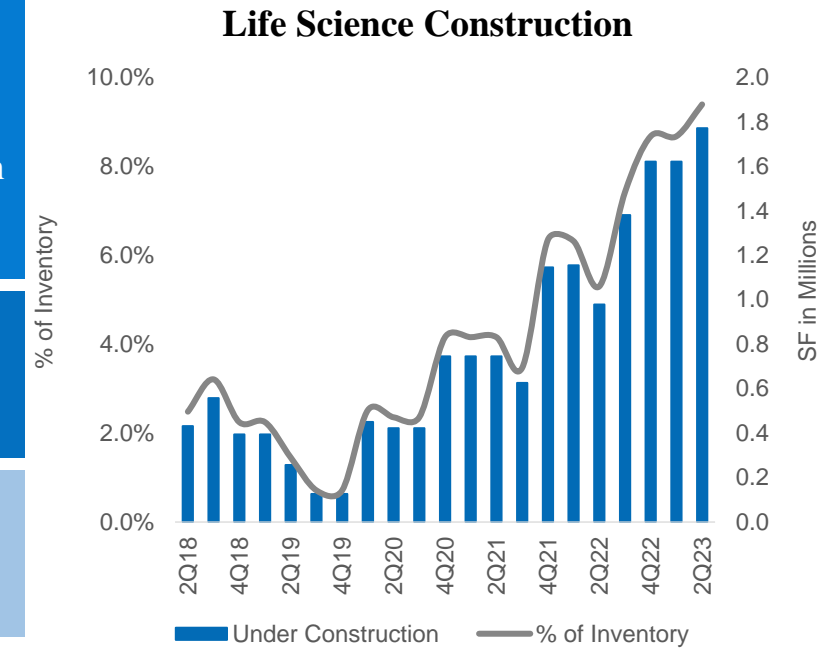
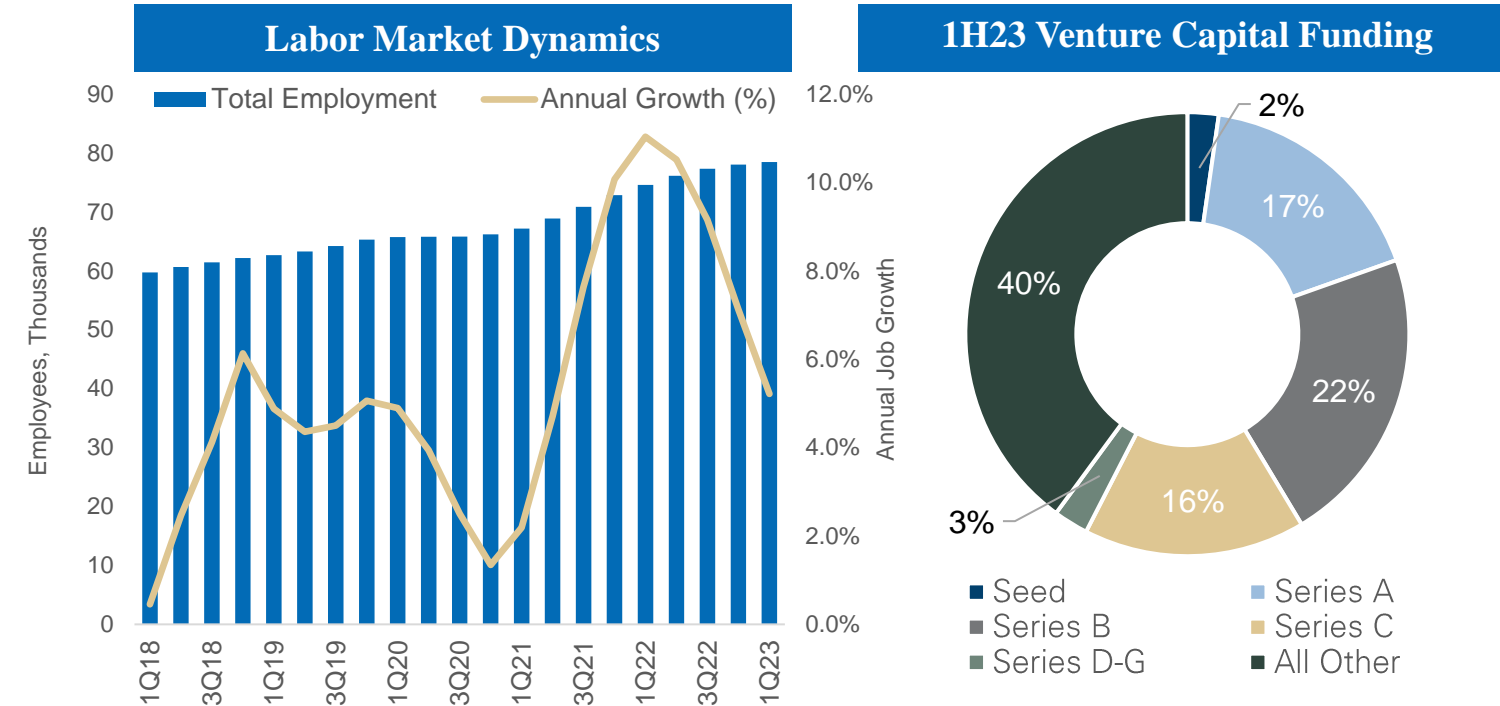


Sources: JobsEQ, Pitchbook, RCA, Newmark Research

\* Total availability is represented instead of total vacancy since the San Francisco Bay Area Market has not historically separated vacancy and availability.

# San Diego

- Sales volume slowed in 2023 as interest rates increased, totaling \$234 million through the first half of the year.
- Venture capital funding decelerated after the historical highs of 2020 to 2021, but total investments over the past 12 months still totaled a respectable \$2.0 billion.
- Development remains historically high, with nearly 2.0 million SF under construction in the life science core and a further 1.8 million SF in emerging submarkets across the county. There is 0.9 million SF of existing space being converted to life science in the core, with an additional 1.2 million SF in emerging submarkets.



**Top Owners**

Company	Total Square Feet	Percentage of Market Share
Alexandria Real Estate Equities	4.6M SF	25%
Blackstone BioMed	2.2M SF	12%
Healthpeak Properties	1.8M SF	10%

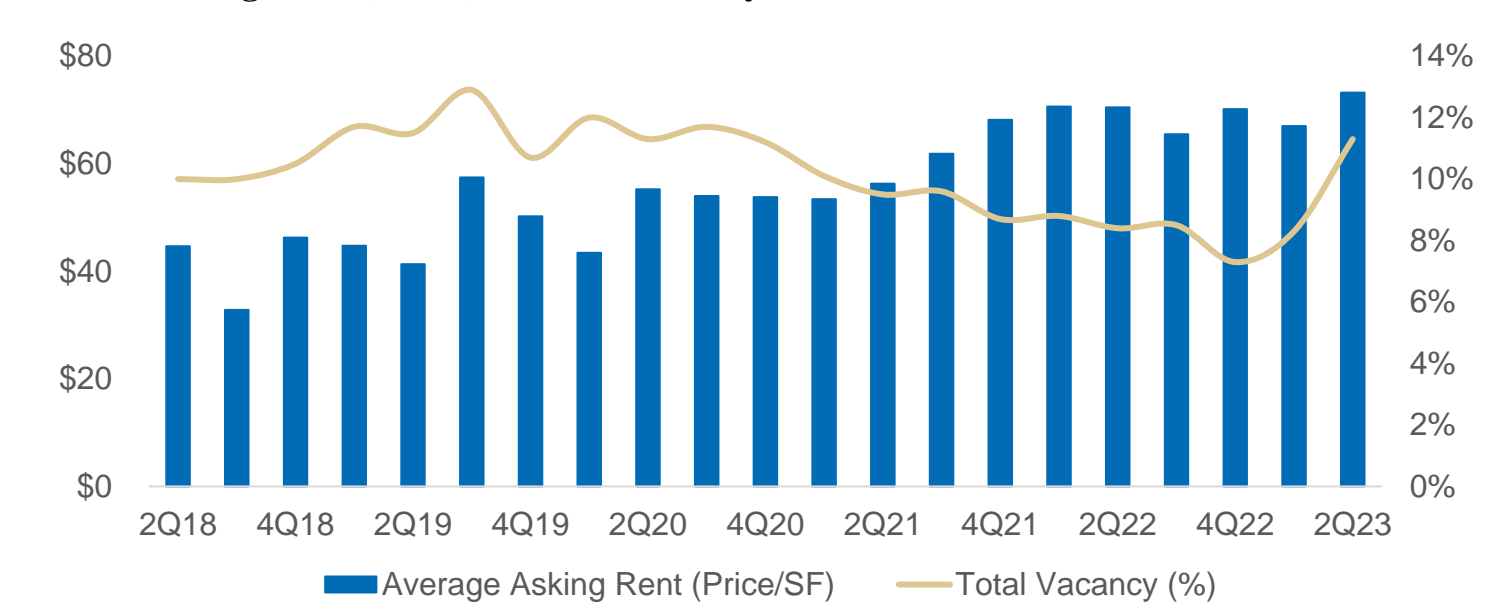
## Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
Agilent Technologies	11011 Torrey Pines Rd.	Torrey Pines	Lease Renewal	32,265
Precision Diagnostics	4215 Sorrento Valley Blvd	Sorrento Valley	Lease Renewal	30,307
Neurocrine	12770 El Camino Real	Del Mar Heights	Lease Extension	26,043

## Select Sale Transactions

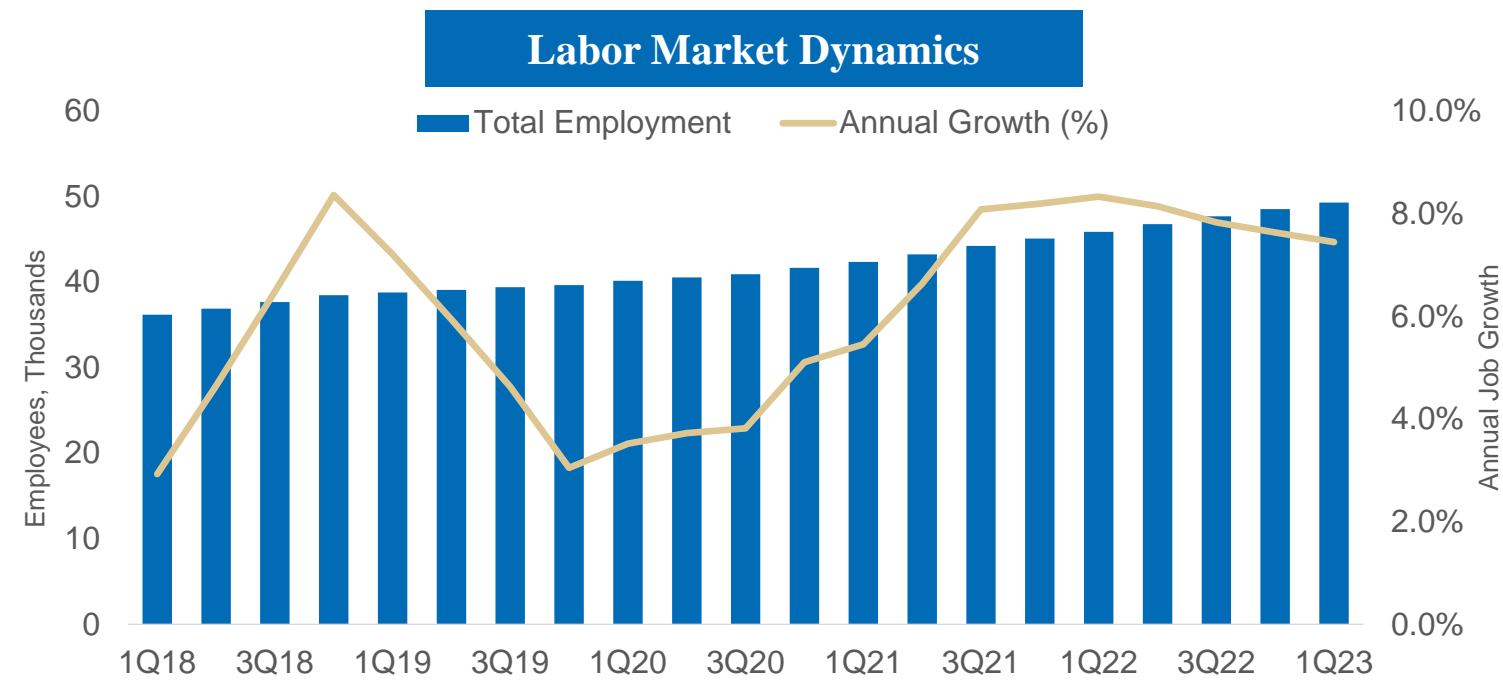
Building / Address	Submarket	Sale Price	Price/SF	Square Feet
3215 Merryfield Row	Torrey Pines	\$149.9M	\$1,256	170,523
9625 Towne Centre Dr	UTC	\$112.4M	\$981	163,648
11119 N Torrey Pines Rd	Torrey Pines	\$86.0M	\$1,186	72,506

## Lab Asking Rent (NNN) and Availability



# Raleigh/Durham (Research Triangle)

- Vacancy has leveled off as a moderate uptick in activity is taking shape; however, sizable amounts of new construction will deliver in the coming quarters.
- Leasing activity is forecasted to increase as macro market stabilization occurs. Large users are still rare, but tours are increasing.
- The life science market in the Research Triangle is now the 4th largest in the country with 24,000 employees.
- Gene therapy company Kriya Therapeutics landed \$150 million in funding to advance its programs as well as acquisitions.



**11.3M SF**  
Total Inventory

**\$35-\$48**  
Total NNN Asking Rent

**13.3%**  
Vacancy

**299K SF**  
YTD Absorption

**1.1 SF**  
Under Construction

**1H23 Venture Capital Funding**

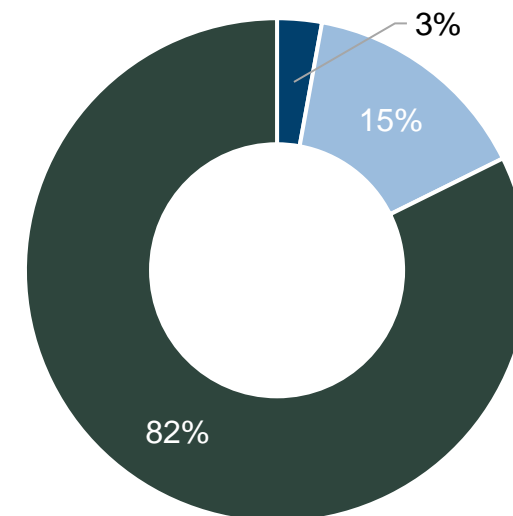
**Top Life Science Owners**

## Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
Catalent	951 Aviation Pkwy, Morrisville (Southport)	RTP/RDU	Direct Lease	130,875
Isolere	5 Laboratory Drive, Durham	RTP/RDU	Direct Lease	17,000

## Select Sale Transactions

Building / Address	Submarket	Sale Price	Price/SF	Square Feet



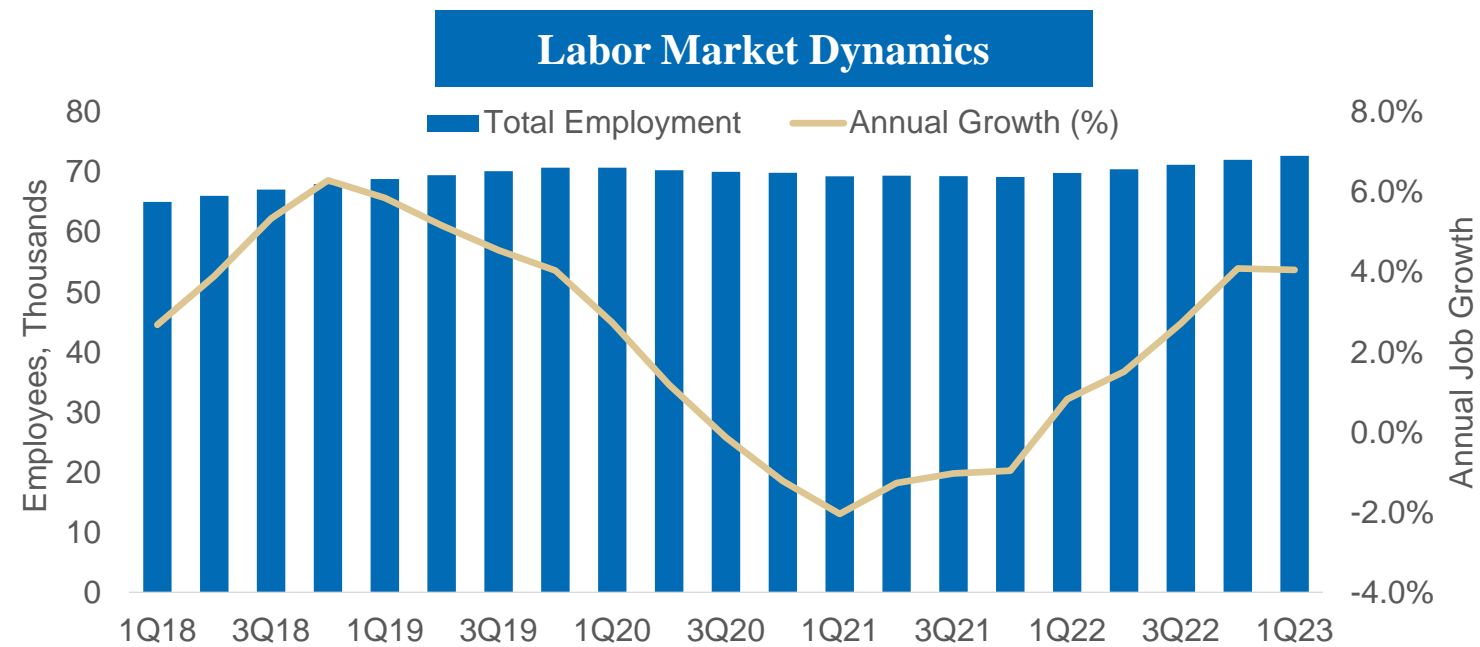
Alexandria Real Estate Equities

Longfellow Real Estate

Trinity Capital / Starwood

# Greater Philadelphia

- The suburban markets have been the most active in terms of deal velocity in the first half of the year, with around 225,000 SF worth of deals executed.
- At the end of the first half of 2023, demand in the market for life science space was 4.6 million SF. Lab and GMP uses each made up half of existing requirements.
- Venture capital funding has been significantly weaker in 2023 compared with the first half of 2022. The \$211 million worth of VC funding in the first half of 2023 is only 37.0% of total capital raised during the same time period last year. In a leaner fundraising environment, life science companies have shelved projects and reduced staff counts to preserve capital.



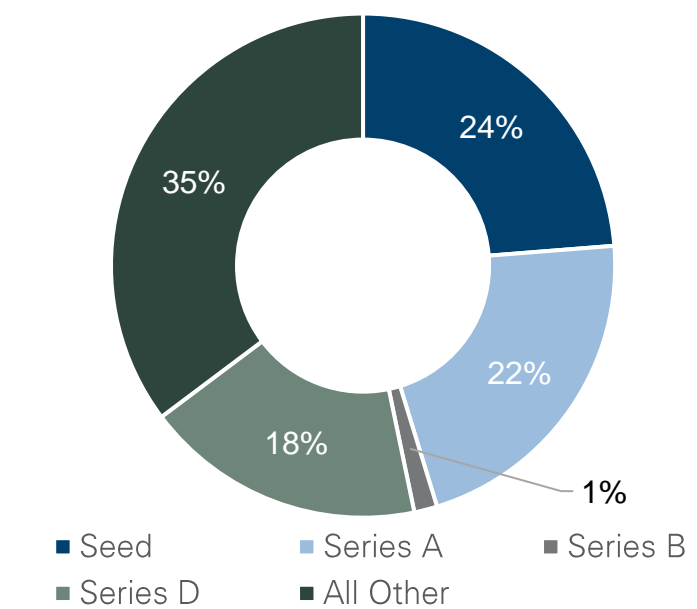
## 1H23 Venture Capital Funding | Top Life Science Owners

### Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
Castle Creek Biosciences	405 Eagleview Blvd	Exton/Malvern	Lease Renewal	86,500
Spark Therapeutics	709 Swedeland Rd	King of Prussia	Direct Lease	62,000

### Select Sale Transactions

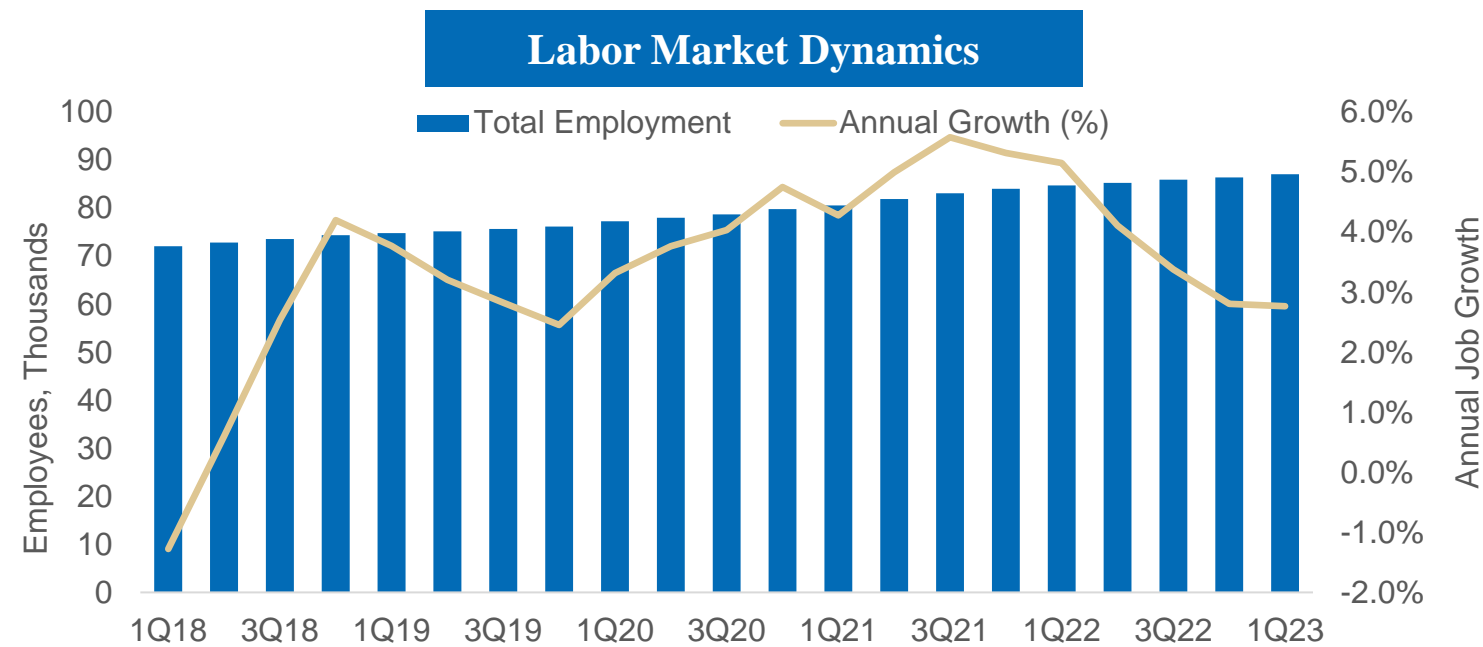
Building / Address	Submarket	Sale Price	Price/SF	Square Feet
466 Devon Park Dr, Wayne	King of Prussia	\$57.0M	\$131	155,200
2450 W. Hunting Park Ave, Philadelphia	Non-CBD Philadelphia	\$14.0M	\$60	232,976



<b>MLP Ventures</b> 1.4M SF   18.6% Market Share
<b>Wexford/Ventas</b> 1.1M SF   14.3% Market Share
<b>Brandywine Realty Trust</b> 566K SF   7.5% Market Share

# Maryland / Mid-Atlantic

- Gradually increasing inventory with steadily increasing vacancy has moderately softened the market.
- Local universities are investing in campuses and programs aimed at supporting labor demand for life sciences in the long term.
- Limited life science investment sales activity occurred in 2022, driven by softening demand, financing challenges and limited assets available to transact.



**18.9M SF**  
Total Inventory

**\$25-45**  
Total NNN Asking Rent

**9.7%**  
Vacancy

**-69K SF**  
YTD Absorption

**1.2M SF**  
Under Construction

**1H23 Venture Capital Funding**

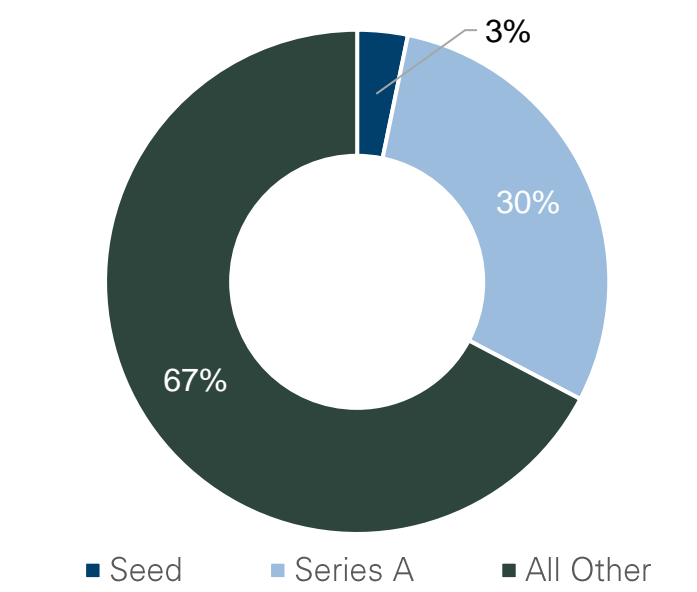
**Top Life Science Owners**

## Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
MacroGenics	9704 Medical Center Drive, Rockville	North Rockville	Direct Lease	122,601
Charles River Laboratories	9603 Medical Center Drive, Rockville	North Rockville	Direct Lease	47,395

## Select Sale Transactions

Building / Address	Submarket	Sale Price	Price/SF	Square Feet
9615 Medical Center Drive	North Rockville	\$40.3M	\$614	65,529
855 N Wolfe Street & 1812 Ashland Avenue	Baltimore Northeast	\$272.0	\$607	448,000



**Alexandria Real Estate**  
4.0M SF | 20.9% Market Share

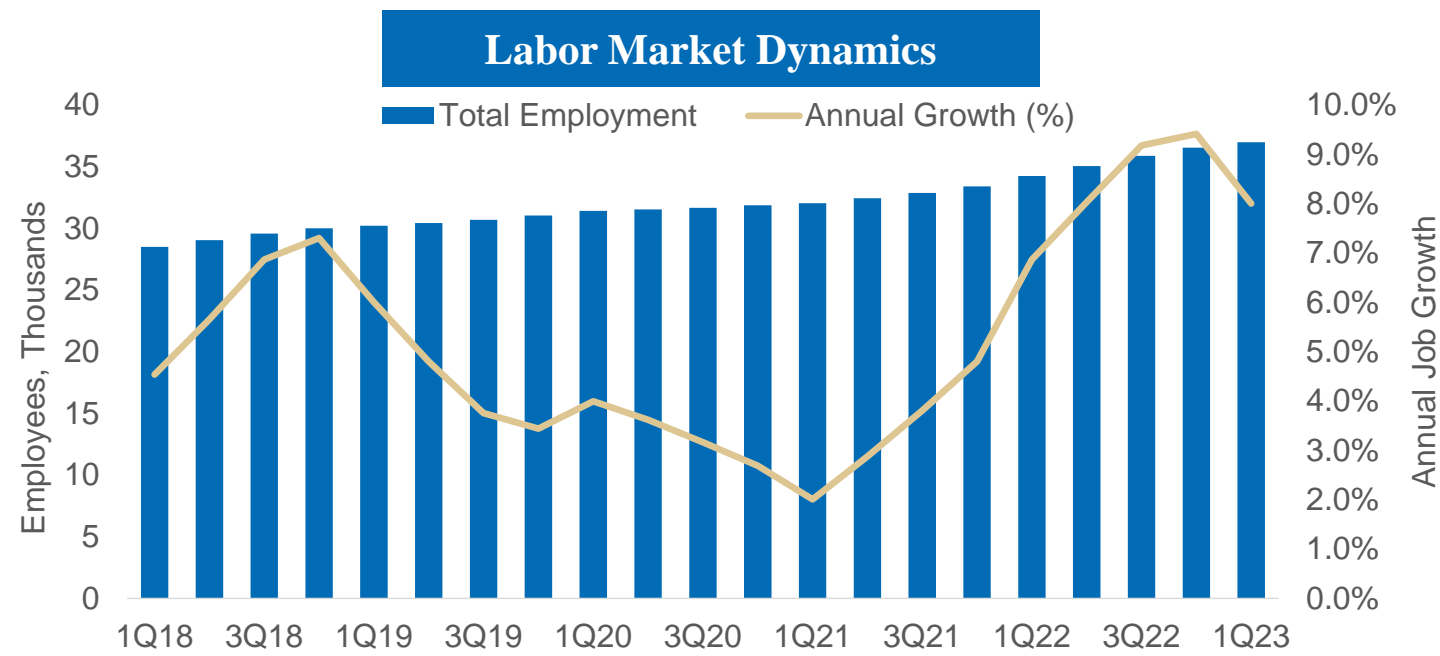
**Matan**  
3.8M SF | 20.2% Market Share

**AstraZeneca**  
1.5M SF | 7.8% Market Share

Sources: JobsEQ, Pitchbook, RCA, Newmark Research  
Data as of 4Q 2022

# Seattle

- The life science sector continues to show positive fundamentals but demand for space has slowed. Despite these challenges, the overall vacancy rate for Puget Sound during the second quarter of 2023 remained low at 5.3%.
- High-quality lab space remains scarce, with most of the availability being in Class B product. Current conversion buildings are seeing limited activity, as users prefer to focus on purpose-built assets.
- Bothell continues to be the relief valve for tenants seeking more cost-effective space. Rental rates for lab space in Bothell currently range from \$32 to \$46/SF NNN.



## 1H23 Venture Capital Funding

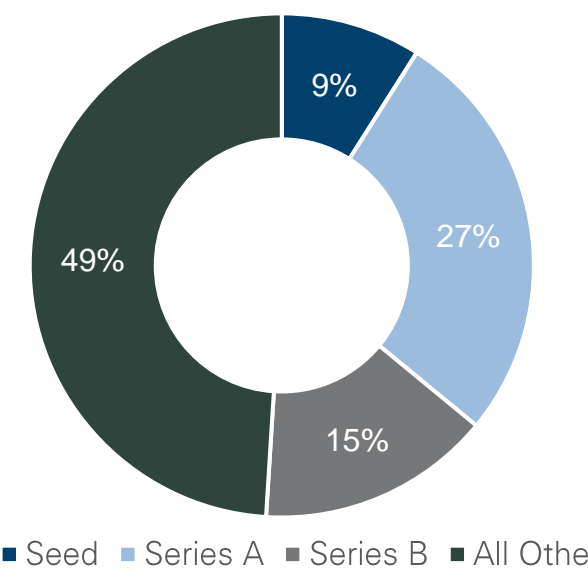
## Top Life Science Owners

### Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
Bristol Myers Squibb	400 Dexter Ave, Seattle	Lake Union	Lease Extension	267,350
IonQ	3755 Monte Villa Pkwy, Bothell	Bothell	Direct Lease	65,086
CUREVO, Inc.	Canyon Park, Bothell	Bothell	Expansion	4,878

### Select Sale Transactions

Building / Address	Submarket	Sale Price	Price/SF	Square Feet
Bellevue Gateway I	Suburban Bellevue	\$35.0M	\$303	115,661



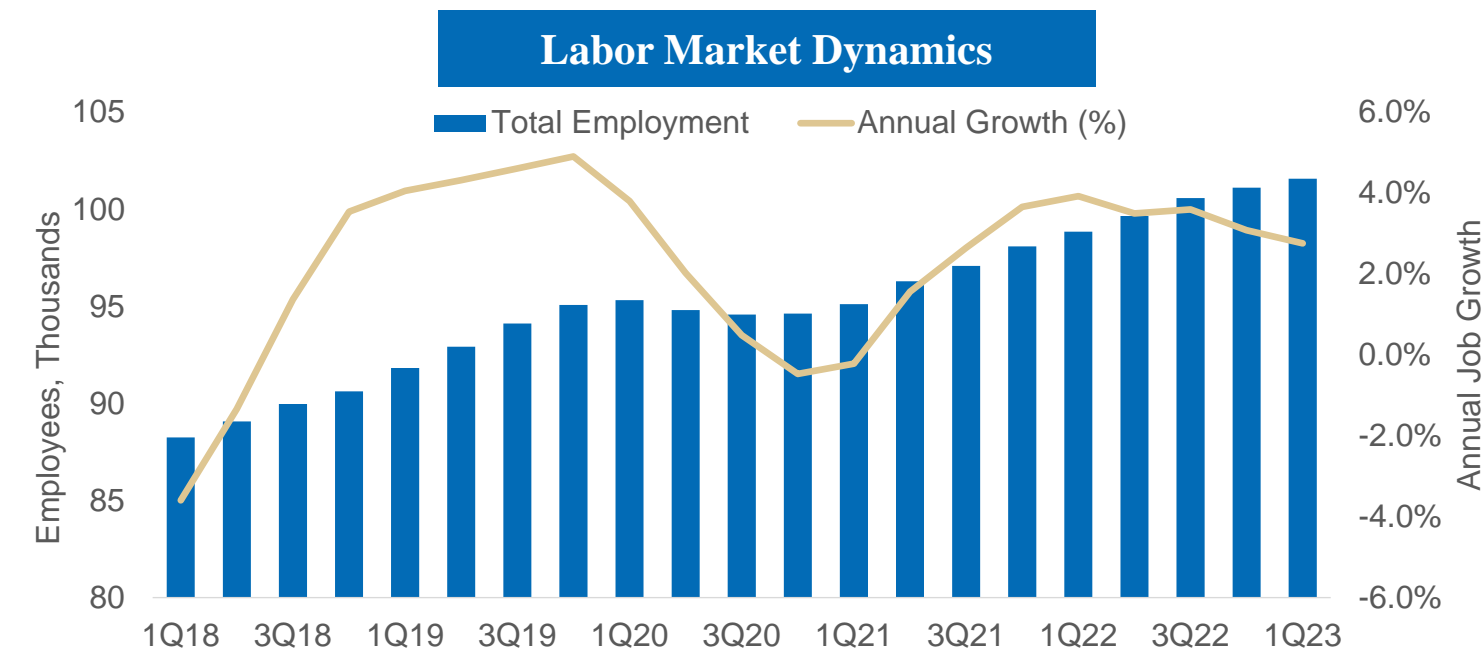
- Alexandria Real Estate**  
3.3M SF | 31% Market Share
- Seattle Children's**  
1.6M SF | 15% Market Share
- Fred Hutch**  
1.3M SF | 13% Market Share

Sources: JobsEQ, Pitchbook, RCA, Newmark Research



# Northern New Jersey

- Northern New Jersey houses 14 of the top 20 pharma companies and 8 of the top 10 R&D companies in the world.
- National economic challenges and rising interest rates have impacted the life science market in Northern New Jersey. Vacancy increased 100 basis points during the second quarter of 2023 to 9.3%.
- Even with economic challenges, employment remains strong, as is the demand for lab space.
- The construction pipeline increased to over 700,000 SF, as construction has begun at the 400,000-SF Beigene Pharmaceutical manufacturing center, located in the Princeton West Innovation Park in Pennington.



**10.6M SF**  
Total Inventory

**\$25.60**  
Total NNN Asking Rent

**9.3%**  
Vacancy

**-291K SF**  
YTD Absorption

**707K SF**  
Under Construction

**1H23 Venture Capital Funding**

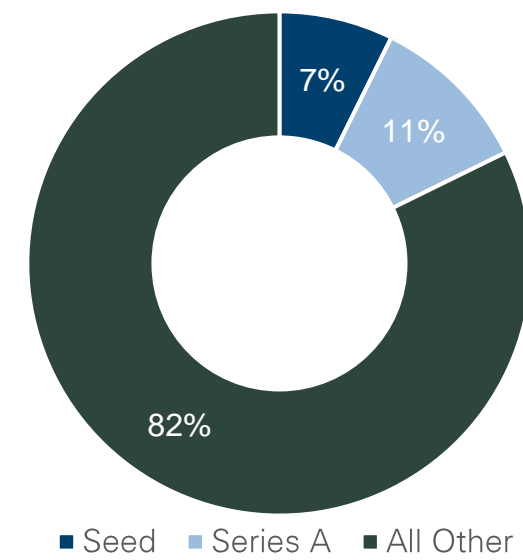
**Top Life Science Owners**

## Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
Roche Molecular Systems	1080 US Highway 202, Branchburg	Western I-78 Corridor	Lease Renewal	82,000
Enzene Biosciences	311 Pennington Rocky Hill Rd, Pennington	Exit 7A	Direct Lease	55,921
Chemetall BASF	675 Central Ave, New Providence	Union Central	Lease Renewal	39,277

## Select Sale Transactions

Building / Address	Submarket	Sale Price	Price/SF	Square Feet
Merk Headquarters Portfolio	Union Central	\$187.5M	\$96	1,944,025
311 Pennington Rocky Hill Rd, Pennington	Exit 7A	\$67.5M	\$341	198,167
107 Morgan Ln, Plainsboro	Exit 8A	\$12.0M	\$270	44,400



**Bristol Myers Squibb**  
2.8M SF | 27% Market Share

**MERCK**  
1.6M SF | 15% Market Share

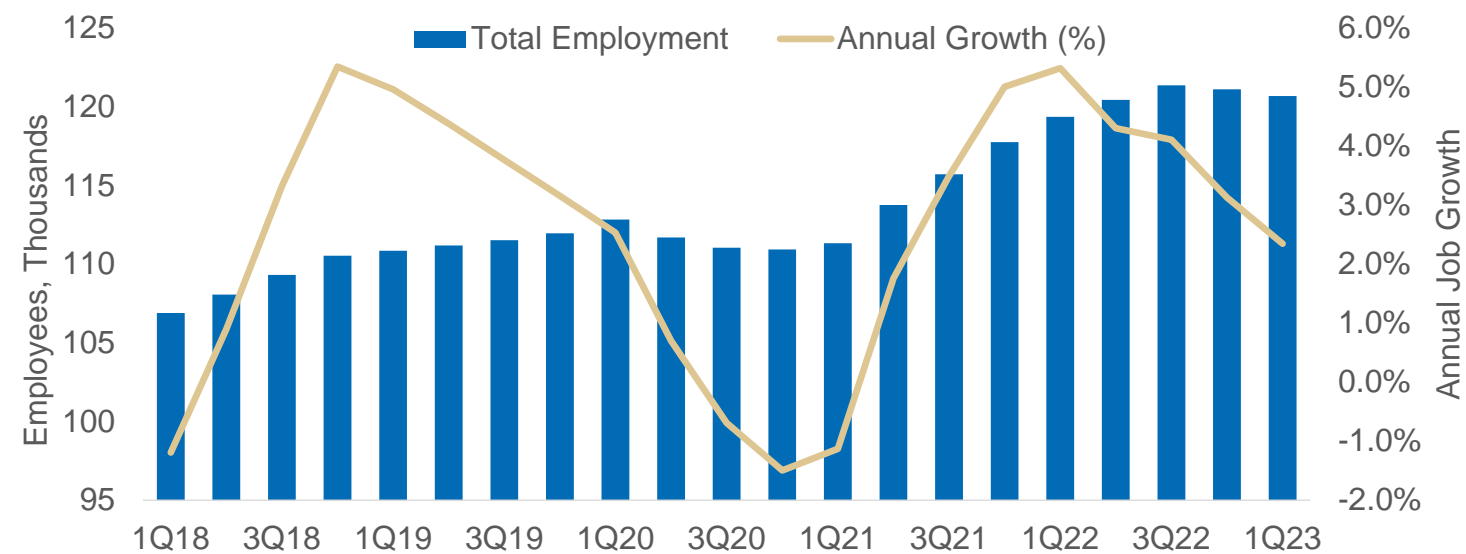
**Johnson & Johnson**  
1.5M SF | 14% Market Share

Sources: JobsEQ, Pitchbook, RCA, Newmark Research

# Los Angeles - Orange County

- While the Los Angeles metro area is considered an emerging life science market, it has the building blocks and momentum to become a major cluster.
- A deep, diverse and educated labor pool provides opportunities for major pharmaceutical and biotechnology companies to expand.
- A lack of leasable lab product is a challenge; however, this has led to development in pockets such as Thousand Oaks, West LA, Pasadena and Irvine. All areas benefit from proximity to major universities and industry occupiers.
- Venture capital investments were up from \$260 million in 2016 to over \$2.0 billion in 2022, while Los Angeles received \$2.5 billion in NIH grants during 2022, more NIH funding than any other market in California.

## Labor Market Dynamics



**11.5M SF**  
Total Inventory

**\$62.00**  
Total NNN Asking Rent

**2.6%**  
Vacancy

**81K SF**  
YTD Absorption

**30K SF**  
Under Construction

## 1H23 Venture Capital Funding

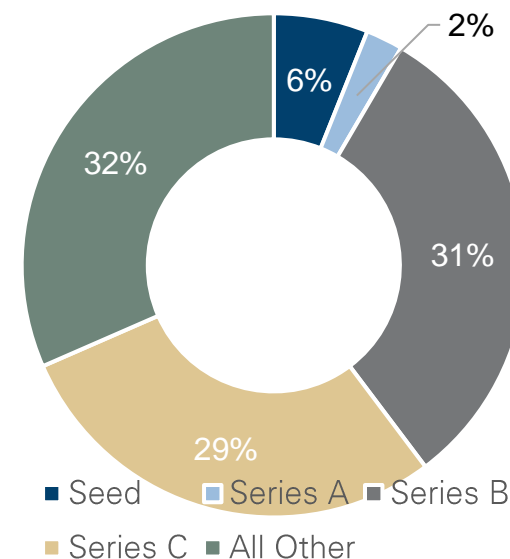
## Top Life Science Owners

### Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
A2 Bio	30601 Agoura Rd	LA/Thousand Oaks	Direct	75,994
CellCarta	80 Empire Dr	OC/Irvine	Direct	21,400

### Select Sale Transactions

Building / Address	Submarket	Sale Price	Price/SF	Square Feet
120 Via Merida	LA: Conejo Valley	\$17,750,000	\$180	98,776



### Amgen

4.0M SF | 35% Market Share

### NantHealth

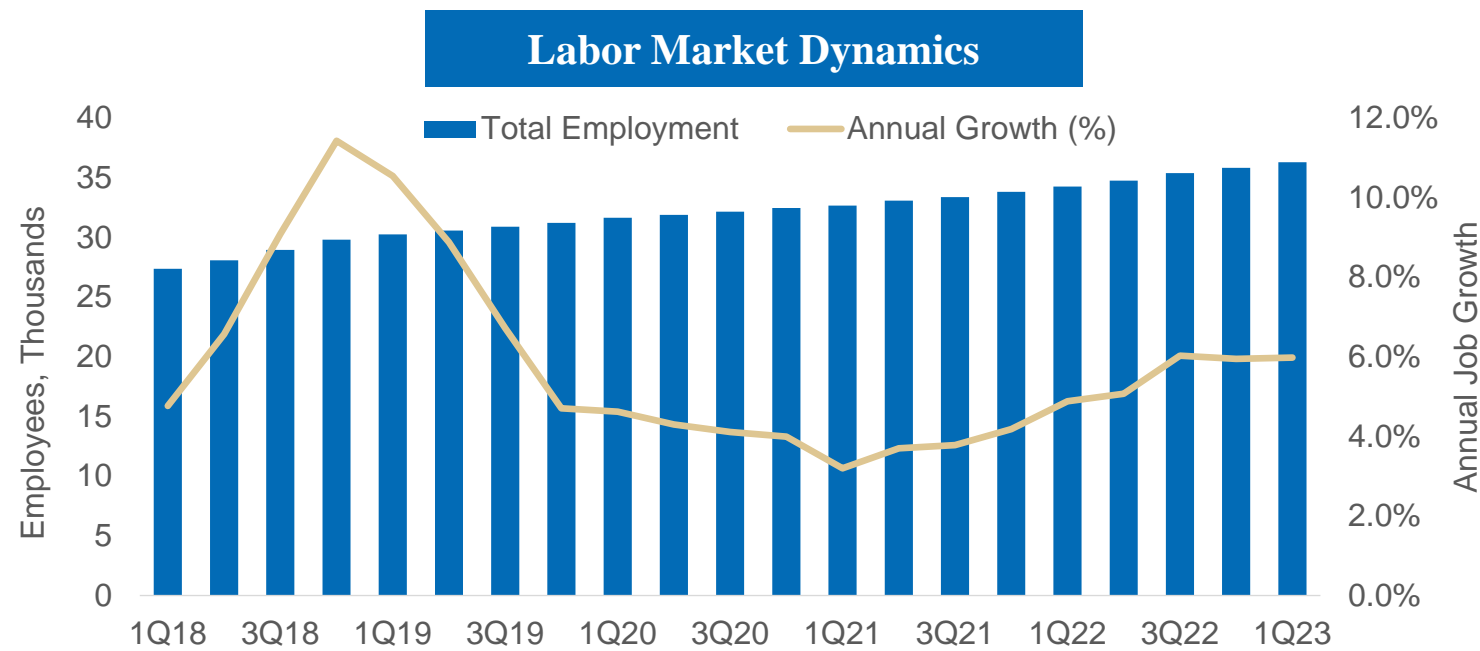
3.0M SF | 26% Market Share

### Alexandria Real Estate Equities

1.0M SF | 9% Market Share

# Houston

- A developer is planning to spend nearly \$1 billion on a new office park for medical and professional space in the Sugar Land area.
- The life science market is expected to deliver close to 1.0 million square feet by the end of 2023.
- Balcor Commercial is developing Parc Binz II, a new 40,000-square-foot building that will attract new life science relocations. This is in close proximity to the Texas Medical Center, one of the largest life science districts in the country.
- Healthcare and life science employment is now approaching 400,000 people in Houston.



**4.9M SF**  
Total Inventory

**\$35-\$65**  
Total NNN Asking Rent

**22.8%**  
Vacancy

**-16K SF**  
YTD Absorption

**700K SF**  
Under Construction

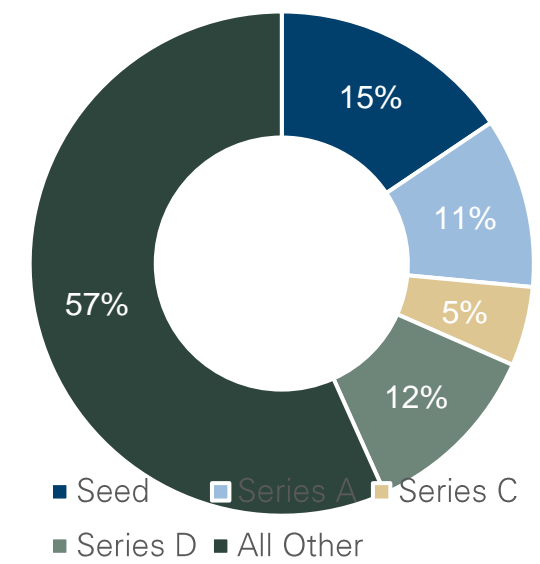
**1H23 Venture Capital Funding**
**Top Life Science Owners**

**Select Lease Transactions**

Tenant	Building / Address	Submarket	Type	Square Feet

**Select Sale Transactions**

Building / Address	Submarket	Sale Price	Price/SF	Square Feet
9615 Medical Center Drive	North Rockville	\$40.3M	\$614	65,529
855 N Wolfe Street & 1812 Ashland Avenue	Baltimore Northeast	\$272.0	\$607	448,000

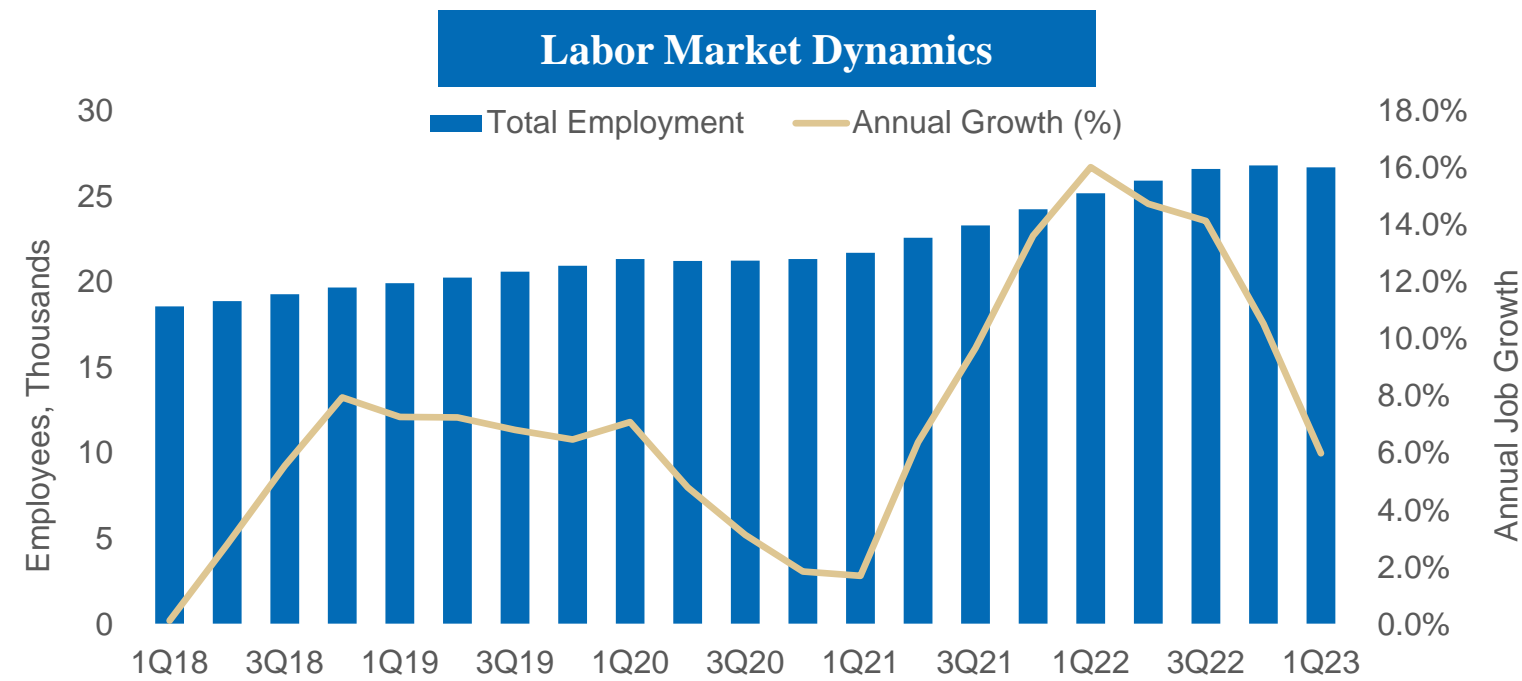


- Beacon Capital Partners**  
700K SF | 16% Market Share
- Texas Medical Center**  
650K SF | 15% Market Share
- Board of Regents of the Texas A&M University**  
572K SF | 13% Market Share

Sources: JobsEQ, Pitchbook, RCA, Newmark Research

# New York City

- The first deal was completed at 125 West End Ave., which is slated for construction completion by year-end 2023. Graviton Bioscience leased 30,000 SF at the redevelopment in July 2023.
- Financial headwinds are causing tenants to re-evaluate their footprint and, in some cases, add space to the market for sublease.
- The City and State announced a public/private partnership called SPARC Kip's Bay, a new 1.5-million-SF hub that will encompass a full city block for life science, academic and medical use. The project is expected to create 10,000 jobs over the next 30 years, generating a \$25 billion impact to the city.
- New York City Mayor Eric Adams announced in early 2023 that the city will invest \$20 million for a 50,000-SF first-in-the-nation facility for office, lab and event space at the Brooklyn Navy Yard.



**3.7M SF**  
Total Inventory

**\$85-\$130**  
Total NNN Asking Rent

**24.8%**  
Vacancy

**118K SF**  
YTD Absorption

**193K SF**  
Under Construction

**1H23 Venture Capital Funding**

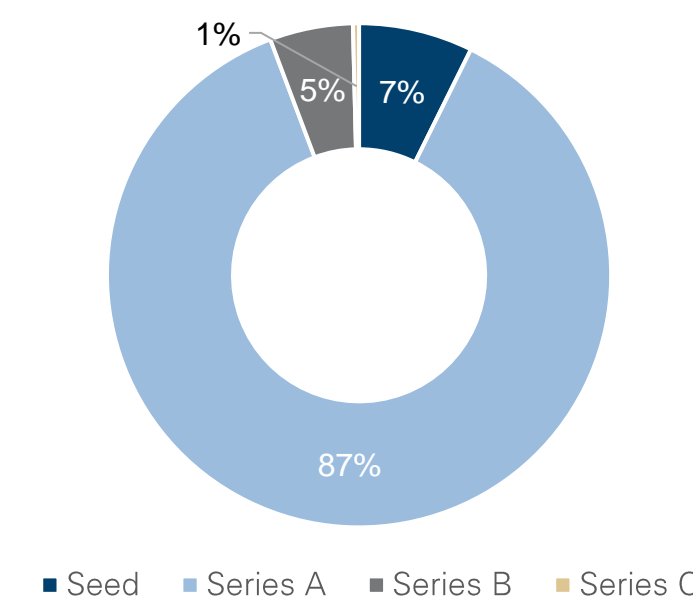
**Top Life Science Owners**

## Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
Graviton Bioscience	125 West End Avenue	Upper West Side	Direct New	30,000

## Select Sale Transactions

Building / Address	Submarket	Sale Price	Price/SF	Square Feet
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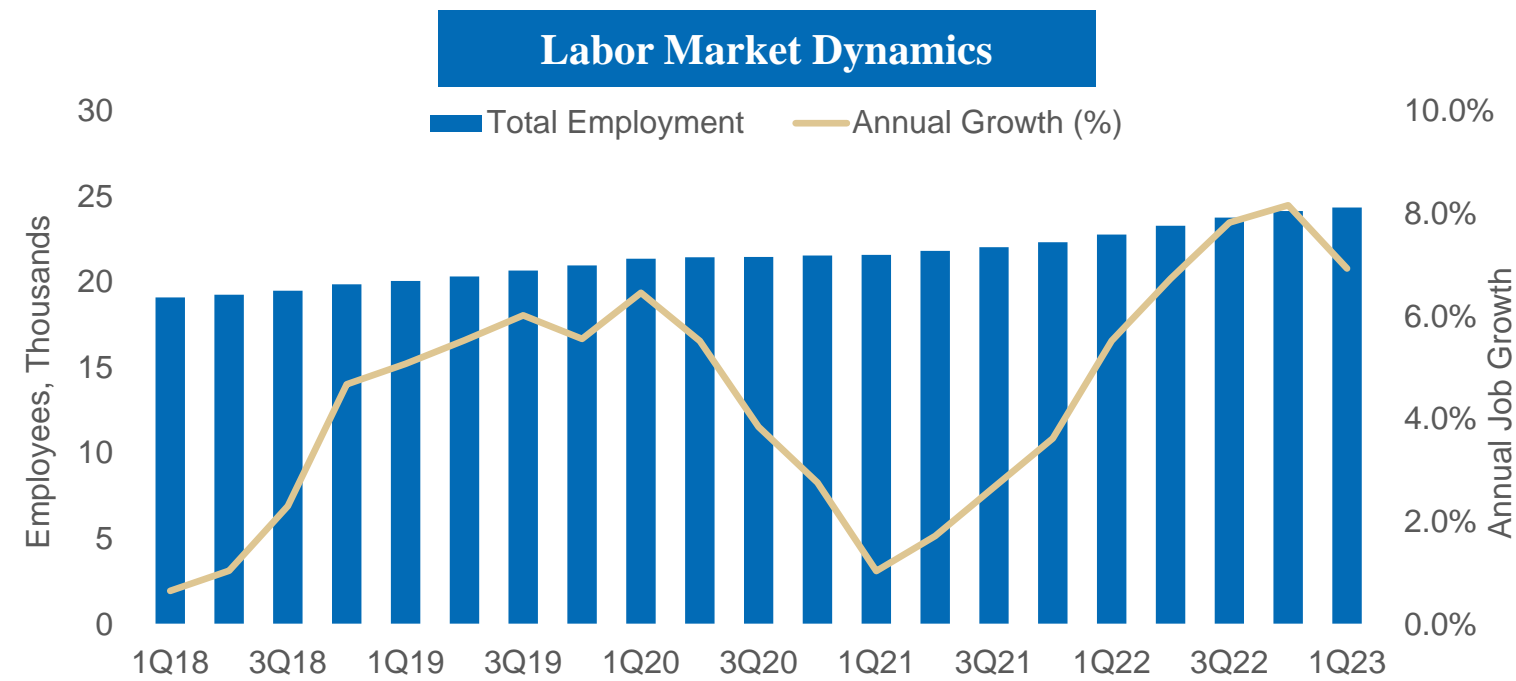


- Alexandria Real Estate Equities**  
913K SF | 25% Market Share
- Taconic Investment Partners & Silverstein Properties**  
326K SF | 9% Market Share
- Deerfield**  
311K SF | 9% Market Share

Sources: JobsEQ, Pitchbook, RCA, Newmark Research

# Denver / Boulder

- The average laboratory tenant requirement is 40,000 SF in the Denver / Boulder market.
- Demand in the Northwest/Boulder submarket is tracking above 800,000 SF.
- Expectations are for continued demand growth as firms are still announcing significant equity raises.



**3.5M SF**  
Total Inventory

**\$50-\$70**  
Total NNN Asking Rent

**5.5%**  
Availability

**164K SF**  
YTD Absorption

**1.1M SF**  
Under Construction

**1H23 Venture Capital Funding**

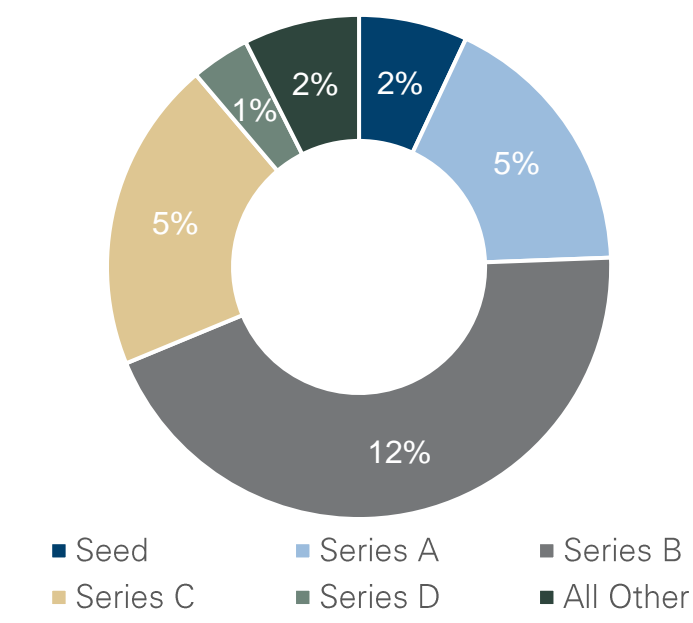
**Top Life Science Owners**

### Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
CordenPharma	2300 55 <sup>th</sup> St., Boulder	Northwest/Boulder	Direct Lease	61,117
Novo Nordisk	4780 Pearl East Cir., Boulder	Northwest/Boulder	Direct Lease	41,507

### Select Sale Transactions

Building / Address	Submarket	Sale Price	Price/SF	Square Feet
Medtronic Campus	Northwest/Boulder	\$188.0M	\$465	404,159



- BioMed Realty**  
1.2M SF | 34.0% Market Share

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- Steelwave**  
481K SF | 14.0% Market Share

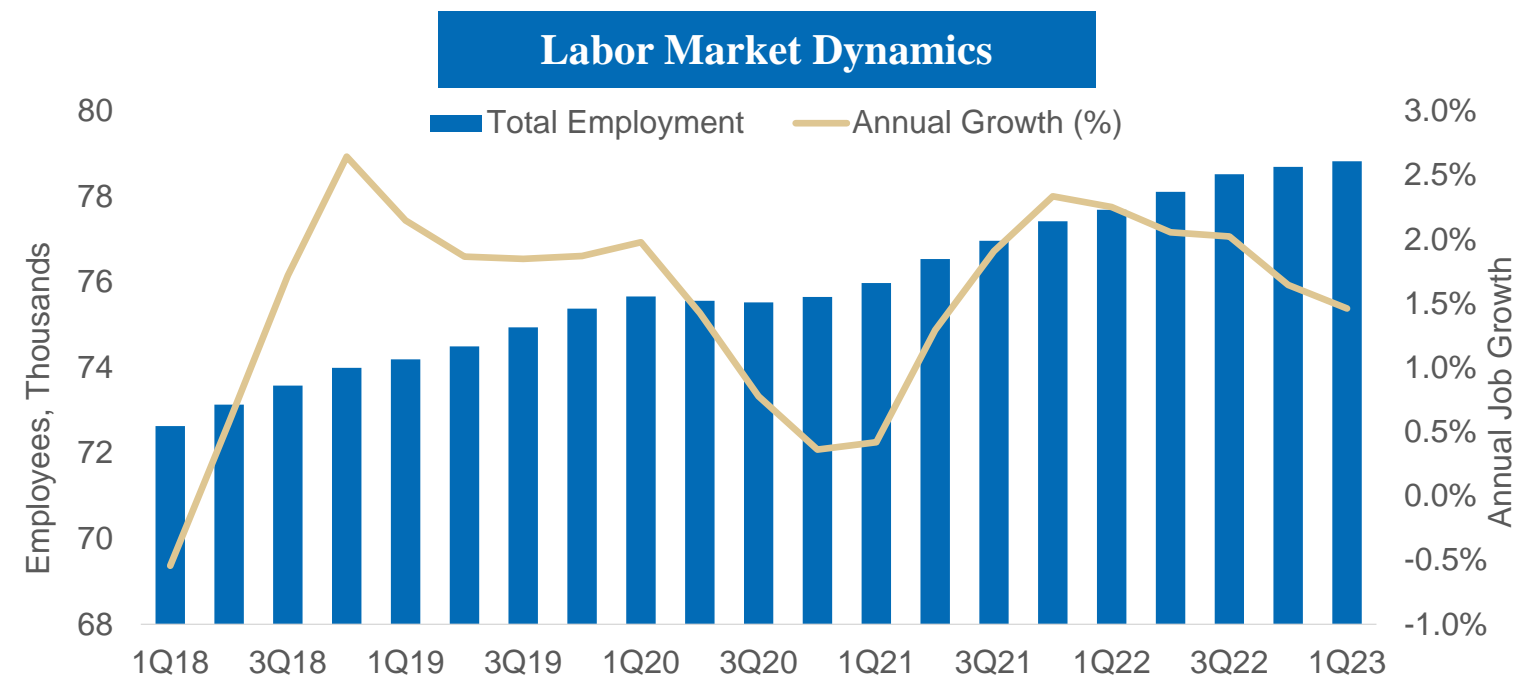
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- Beacon Capital Partners**  
439K SF | 13.0% Market Share

Sources: JobsEQ, Pitchbook, RCA, Newmark Research

# Chicago

- Following the delivery of two vacant buildings, vacancies in Chicago's life science sector are now roughly 50.0%. The region's life science inventory is expected to grow significantly in the next few years. Trammell Crow's new \$225-million, 300,000-SF life science building in Hyde Park is expected to deliver in the fall of 2024.
- Chicago is home to 185 pharmaceutical and life science companies, employing nearly 90,000 people.
- The Chicago region ranked ninth in NIH funding (\$1.2 billion), patents (1,755) and VC funding (\$989.57 million in 2019 and 2020).



**1.8M SF**  
Total Inventory

**\$36.25**  
Total NNN Asking Rent

**50.2%**  
Vacancy

**30K SF**  
YTD Absorption

**1.3M SF**  
Under Construction

**1H23 Venture Capital Funding**

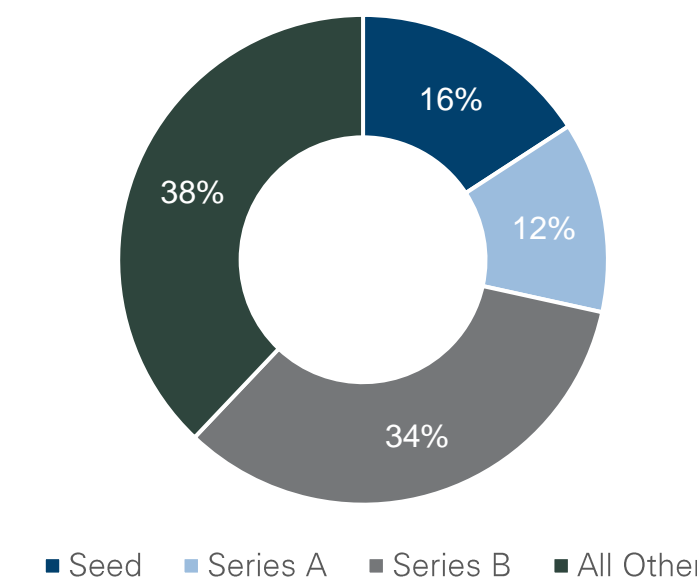
**Top Life Science Owners**

## Select Lease Transactions

Tenant	Building / Address	Submarket	Type	Square Feet
Chan-Zuckerberg Biohub	1375 West Fulton St, Chicago	Fulton Market	Direct Lease	26,000
The University of Chicago	5201 S Harper Ave, Chicago Hyde Park		Direct Lease	20,000

## Select Sale Transactions

Building / Address	Submarket	Sale Price	Price/SF	Square Feet



- Trammell Crow Company**  
725K SF | 40% Market Share

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- Mark Goodman & Assoc.**  
503K SF | 28% Market Share

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- Sterling Bay**  
475K SF | 26% Market Share

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