Intelligent Investment

2024 U.S. Life Sciences Outlook

REPORT

Industry Innovation to Thrive Despite Cautious Capital Markets

CBRE RESEARCH JANUARY 2024



Despite Headwinds, Life Sciences Industry Poised for Growth in 2024

The life sciences industry is fueling business growth and real estate demand around the world, and 2024 will be no exception. Advances in biotechnology, medical devices and consumer products are focused on unmet medical needs and advances in sustainable materials. While the past year has been hard on the small-cap biotech industry, life sciences stock indices such as XBI and NBI showed noticeable improvement in late 2023 in line with the S&P 500 and Dow Jones Industrial Average.

Like many industries, life sciences is facing external headwinds in 2024, including high interest rates, a slowing economy and geopolitical conflicts. Nevertheless, life sciences industry fundamentals remain solid, with good prospects for recovery when these headwinds recede. Given the conditions on Wall Street and in the venture capital market, many life sciences companies are emphasizing capital preservation with a more conservative investment approach.

We trust you will find CBRE's 2024 U.S. Life Sciences Outlook report helpful for your planning and investment. If you have any questions or would like to explore what these market drivers mean for your business, please contact us at any time. For more information on CBRE's Life Sciences Practice, please visit www.cbre.com/lifesciences.

Matt Gardner CBRE Life Sciences Advisory Leader

Executive Summary

Artificial intelligence could accelerate revolutionary advancements in U.S. life sciences this year. U.S. clinical trials of drugs should continue at record levels, as FDA approvals of novel drugs in 2023 neared the secondhighest annual total over the past 25 years. Industry partnerships, licensing agreements and R&D expenditures, as well as government funding and philanthropy, will stimulate growth despite high interest rates entering 2024. The nearly \$18 billion in life sciences venture capital funding for the year ending Q3 2023 was down by 46% from the peak annual total of \$33 billion in calendar year 2021. The IPO market also remains relatively inactive. This sluggish capital markets activity has lowered demand for lab/R&D space, with negative net absorption of 1.5 million sq. ft. in Q3 2023.

It's unlikely there will be enough demand in 2024 for the nearly 38 million sq. ft. of new lab/R&D space currently under construction. While the potential for oversupply is greatest in Boston-Cambridge, the San Francisco Bay Area and San Diego, supply and demand should remain more balanced in the 10 other primary markets tracked by CBRE Research. The balance between lab/R&D supply and demand in 2024 could improve if venture capital funding increases. Expectations that the Federal Reserve will cut interest rates may spark some transactions that have been delayed in recent years.

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of Life Sciences Innovation & Expansion

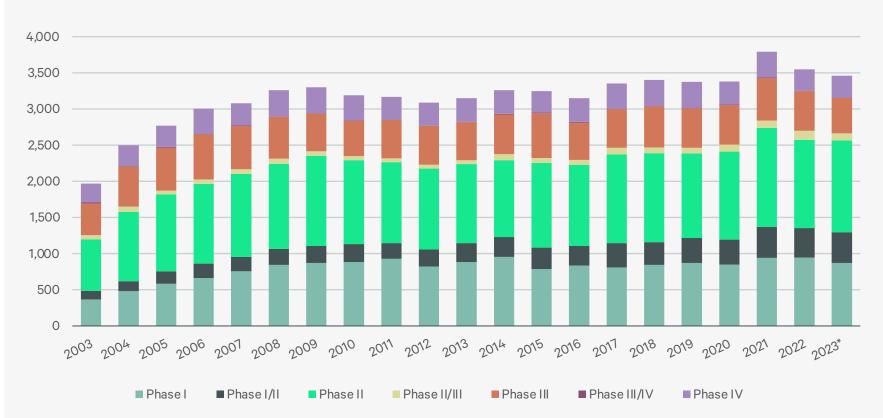
Various drivers of life sciences industry expansion appear well entrenched, acting as a stabilizing force in the near term and a catalyst for long-term growth.

The number of drug clinical trials in the U.S. has stabilized to more normal levels since a surge in 2021 but remains elevated (Figure 1). Furthermore, the current share of trials in Phase 1 or 2 stages (71.4%) is at its highest in over two decades, potentially leading to above-average growth of drug approvals and company formations.

Share of 2023 clinical trials in Phase 1 or 2, the highest since 1998.



FIGURE 1: U.S. Clinical Trials of Drugs

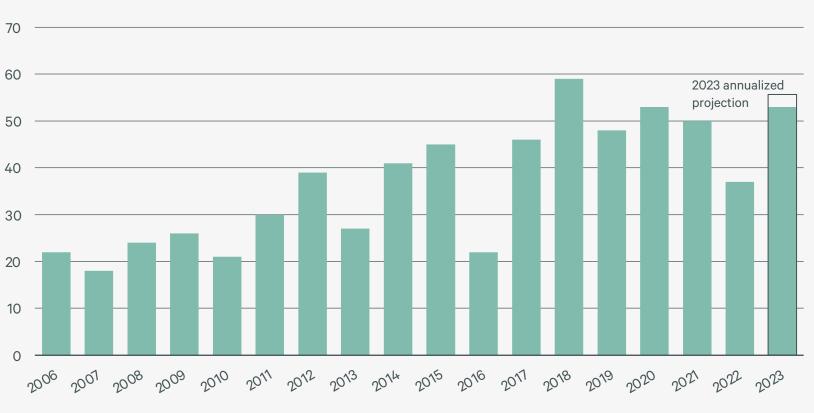


^{*}As of November 6, 2023.

Note: Interventional trials planned, completed or ongoing. Excludes device, surgical, diagnostic and behavioral studies. Source: GlobalData, Q4 2023. 2023 is on track to be one of the top three years for novel drug approvals by the U.S. Food & Drug Administration (FDA). While the uptick likely reflects some of the backlog the FDA has been clearing since the pandemic, it also underscores a high degree of industry innovation.



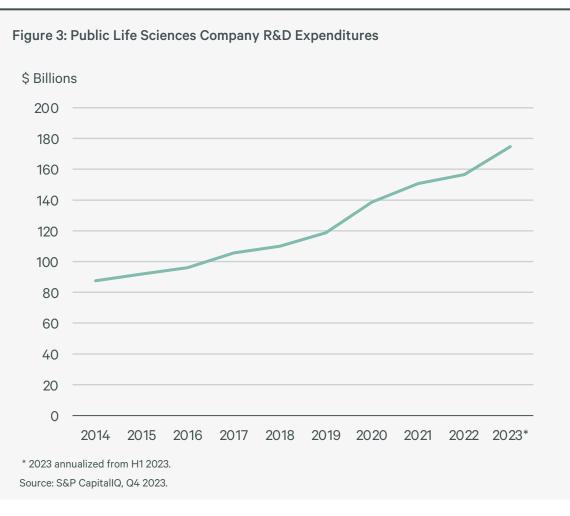


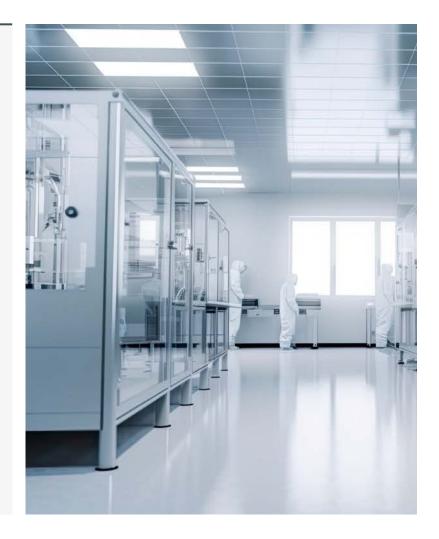


Note: 2023 projection annualized from December 10, 2023. Source: U.S. Food & Drug Administration, CBRE Research, Q4 2023. Despite a decline in venture capital funding and IPO activity, the amount of R&D spending by public companies continues to rise (Figure 3).

Even in the peak year of 2021 for venture capital funding, public life sciences company R&D expenditures of \$151 billion were roughly triple the amount of venture capital and IPOs in the U.S.

In many respects, R&D spending reflects the much more favorable conditions for large-cap life sciences companies in today's business environment that will underpin growth of the industry.

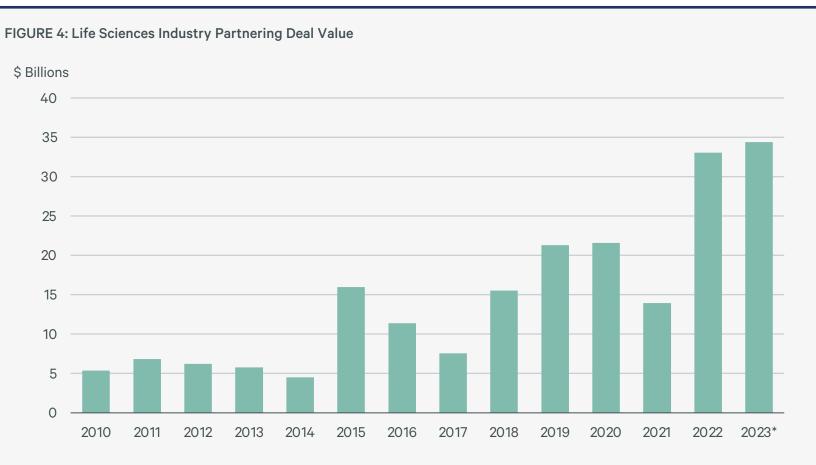




The more favorable financial status of large-cap life sciences companies has enabled them to commit to record-setting partnership deals and licensing activity.

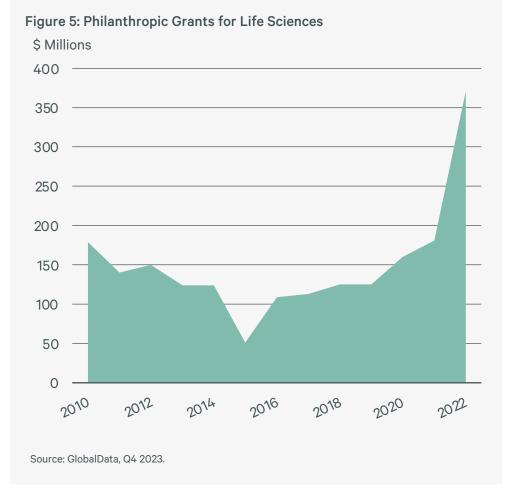
There has been a surge in partnering deals since the decline in equity markets and venture capital funding, as less-capitalized companies became more agreeable to deals with stronger partners.

In some of these partnerships, efficiencies and risk reduction can help advance certain scientific work that might otherwise be curtailed. Despite some successful outcomes, other companies are cutting their research pipelines and trials to operate in a less-favorable economic environment.



*As of October 27, 2023. Source: GlobalData, Q4 2023.

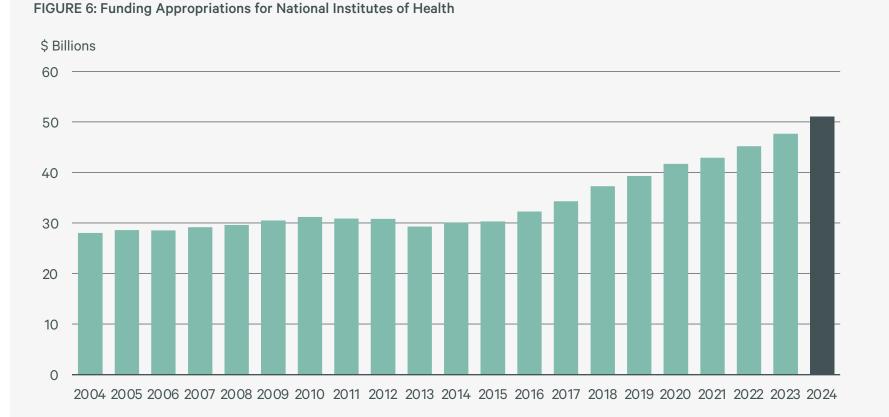
Although a smaller source of life sciences funding, philanthropic grants are growing (Figure 5). One of the most notable new sources of philanthropic funding is the Chan-Zuckerberg Initiative, which provides funding to life sciences ventures and has established the Chan-Zuckerberg Biohub Network in San Francisco, Chicago and New York City.





Annual funding from the National Institutes of Health (NIH) has continued to grow since 2016. A requested 7.2% increase in NIH appropriations for fiscal year 2024 would be the second largest since 2003.

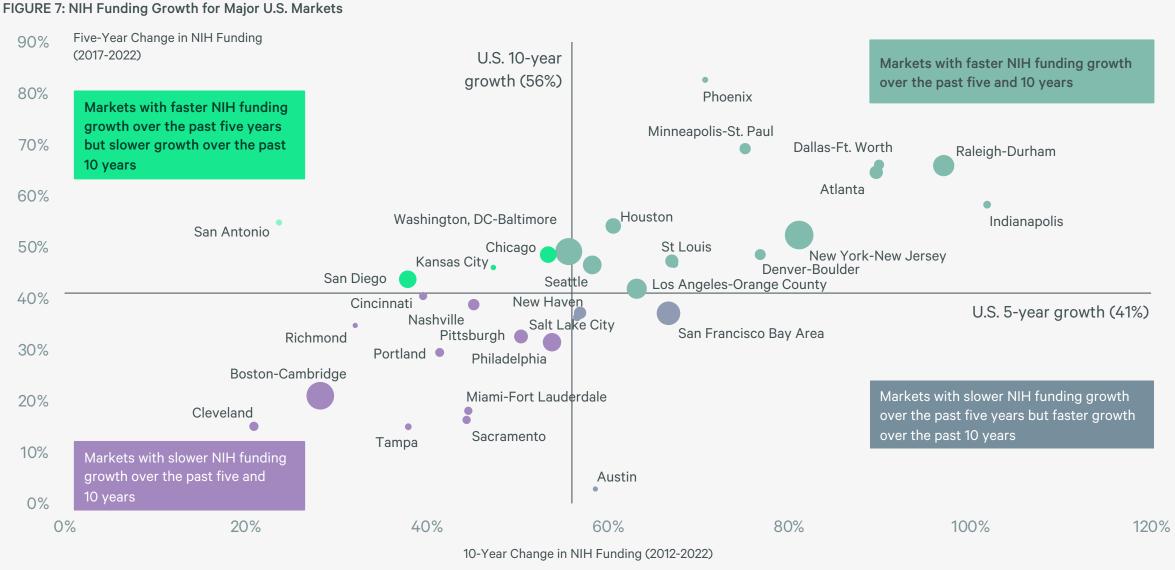




Source: National Institutes of Health, CBRE Research, Q4 2023.

Markets with the biggest increases in NIH funding over the past five and 10 years include Raleigh-Durham, Dallas-Fort Worth, Atlanta, Phoenix, Minneapolis-St. Paul and Indianapolis (Figure 7). The large markets of New York-New Jersey, Washington, D.C.-Baltimore and Los Angeles-Orange County also grew at an above-average pace, while the premier life sciences markets of Boston-Cambridge, the San Francisco Bay Area and San Diego had more moderate growth in NIH funding over the past decade.

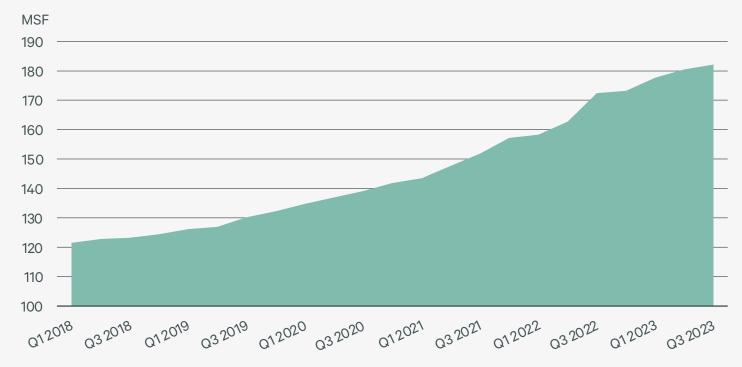




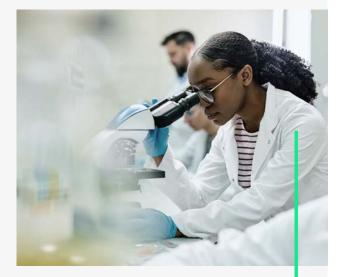
Notes: Major markets with more than \$100 million in annual NIH Funding in 2022. Size of circle equates to size of 2022 NIH funding. Source: National Institutes of Health, CBRE Research, Q4 2023.

Ongoing scientific discovery, supported by major sources of private and public capital, continues to fuel increased demand for lab/R&D space. To meet this demand, total inventory of lab/R&D space in nine major markets has grown by 48% or roughly 59 million sq. ft. over the past five years. Construction deliveries of several million more sq. ft. are expected in 2024.

FIGURE 8: Total Lab/R&D Space in Nine Major Markets*



*Boston-Cambridge, San Francisco Bay Area, San Diego, Washington, D.C.-Baltimore, Philadelphia, New Jersey, Seattle, Los Angeles, Raleigh-Durham. Source: CBRE Research, Q4 2023.



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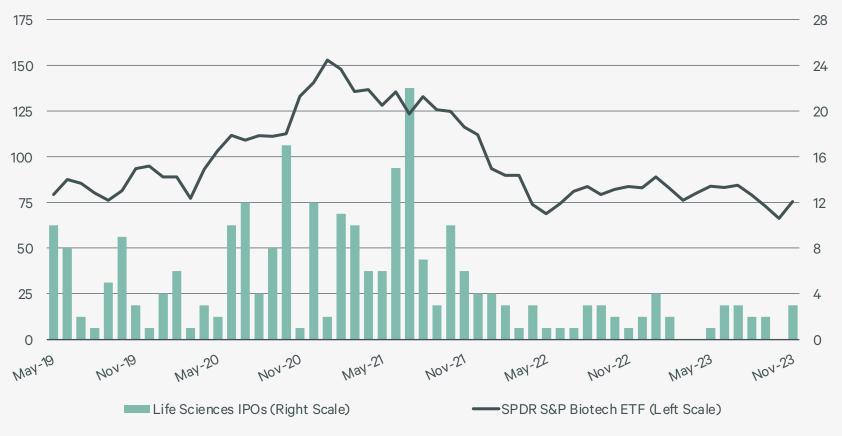
02 Capital Markets Challenges

Aside from the many positive fundamentals underpinning life sciences expansion, certain factors that are limiting company formation and growth include lower equity valuations and public offerings, as well as less venture capital funding. However, expectations that the Federal Reserve will cut interest rates in 2024 could reverse this trend.

Life sciences equity markets have remained relatively sluggish over the past two years. While the benchmark SPDR S&P Biotech ETF index fund has dropped by 51% from its peak in early 2021, as of mid-December it was up by nearly 31% from its October low. The recent improvement reflects expectations of interest rate cuts and a less-severe economic slowdown in 2024. This in turn could improve investor sentiment and activity.

Meanwhile, there were only 20 life sciences IPOs in 2023 (through November), compared with 102 in 2021.

FIGURE 9: Life Sciences Equity Market Trends



Source: S&P CapitalIQ, YahooFinance, CBRE Research, Q4 2023.

With regard to venture capital, annual funding as of Q3 2023 was down by 46.3% from its peak in Q4 2021. Although this pullback has not been as severe as the 52.3% decline between 2001 and 2003, it still has constrained the growth of many companies that rely on such financing and in some cases resulted in layoffs, less space usage and even company dissolutions.

However, annual venture capital funding ending in Q3 2023 increased for the first time since 2021 and was roughly 17% higher than the prepandemic average during 2018-2019 (Figure 10).

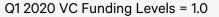


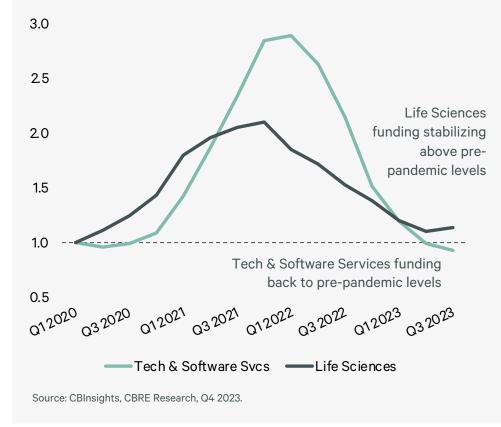
FIGURE 10: U.S. Life Sciences Venture Capital Funding

Nevertheless, as of mid-December 2023, venture capital investment was trending decidedly lower, likely to dampen the positive momentum in 2023. The potential decline in Q4 funding, however, is considered to be a temporary pullback as investors adjust to a potential decline in interest rates.

By comparison with the life sciences industry, venture capital funding for the tech & software services industry is down by 68% since early 2022 and is just below pre-pandemic levels (Figure 11).



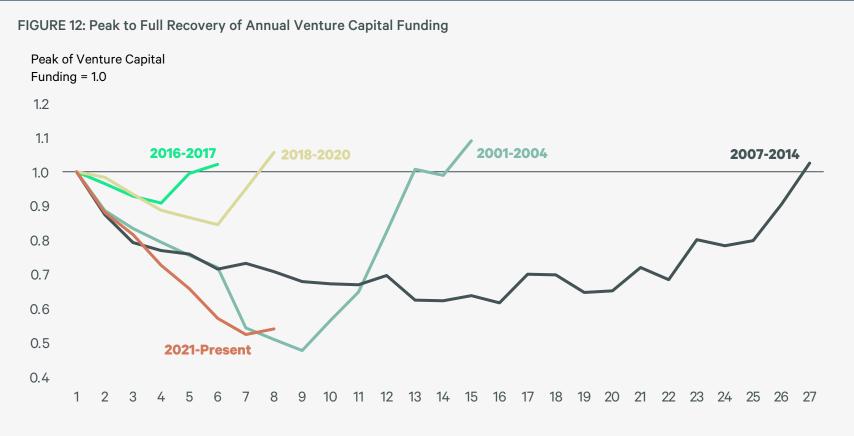






The recent pullback in venture capital funding has not been as severe as the one in 2001 and appears to have ended earlier (Figure 12).

The amount of venture capital expected in 2024 is difficult to predict, and an expected decline in funding in Q4 2023 suggests annual funding has not bottomed out yet. But the expectation of lower interest rates in 2024 may spark a recovery, with an estimated \$10.3 billion in venture capital dry powder awaiting deployment for life sciences companies.



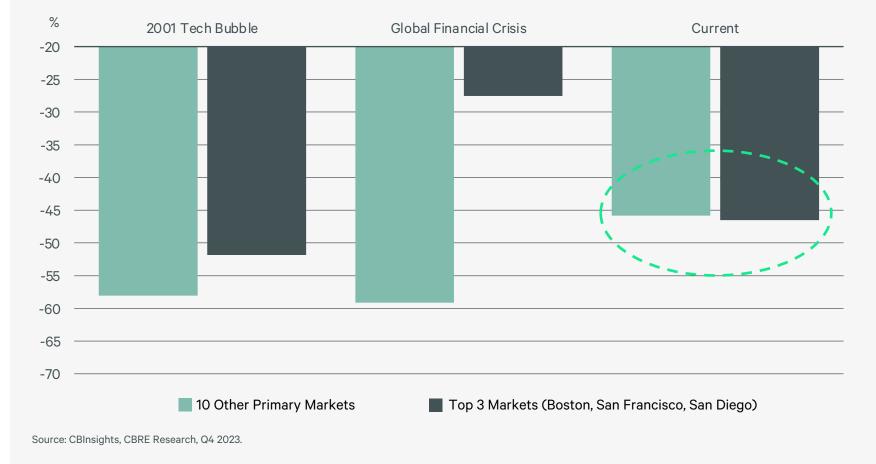
Quarters after Peak in Venture Capital Funding

Source: CBInsights, CBRE Research, Q4 2023.

The decline in venture capital funding this cycle has been slightly greater in the top three U.S. life sciences markets (Boston-Cambridge, the San Francisco Bay Area and San Diego) than in the other 10 primary markets tracked by CBRE.

Annual venture capital funding ending Q3 2023 for the top three markets has declined by 46.5%, compared with a 45.8% decline for the other 10 primary markets combined. This is a shift from funding levels during the Global Financial Crisis when the top three markets had significantly lower funding declines (-27.6%) vs. the other 10 primary markets (-59.2%).

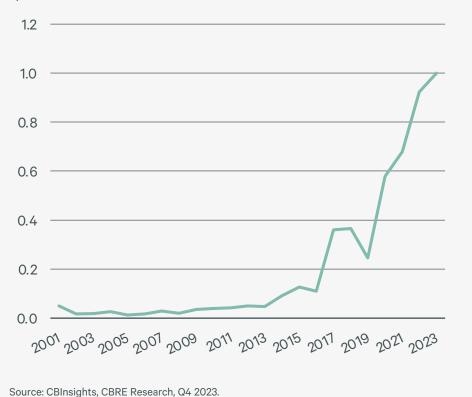




Despite lower levels of funding and increased scrutiny of new investments, there remains an ongoing surge in the earliest venture capital investment rounds (angel, seed, pre-seed). Annual funding for these early rounds has surged by more than 300% since 2019 and although accounting for only 8.6% of all annual venture capital funding ending Q3 2023 underscores the importance that investors are placing on cuttingedge innovations.



\$ Billions



Amount of dry powder in U.S. life sciences venture capital



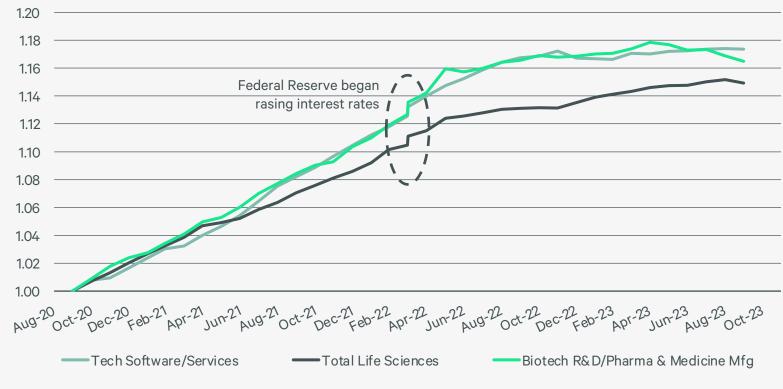
o3 Employment Trends & Outlook

Life sciences job growth has slowed to an average of 2,921 per month since July 2022 from more than 10,000 per month in 2021. This slowdown is even more pronounced in the Biotechnology R&D and Pharmaceutical & Medicine Manufacturers sectors (Figure 15), which have been a key source of demand for top-tier lab/R&D space in the U.S. over the past few years.



FIGURE 15: U.S. Employment by Industry

Employment levels = 1.00 in September 2020

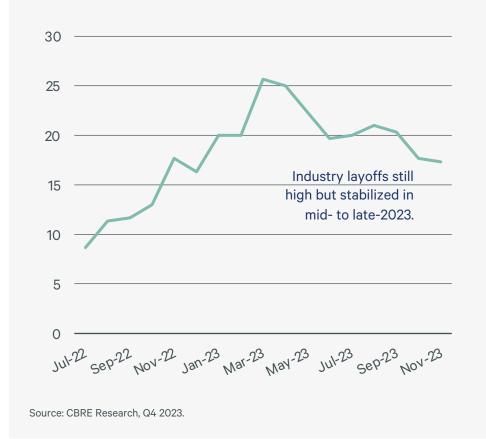


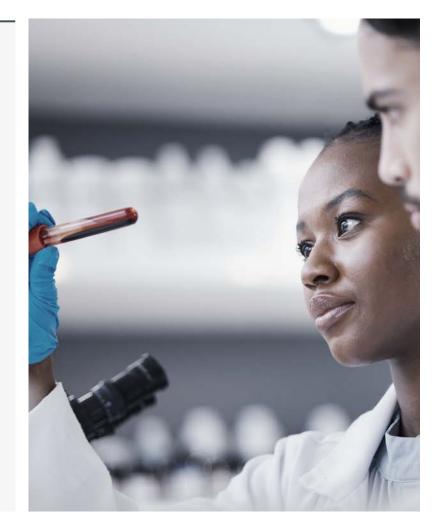
Source: U.S. Bureau of Labor Statistics, CBRE Research, Q4 2023.

Despite total life sciences employment continuing to grow, the number of life sciences companies announcing layoffs remains relatively high, although down from earlier in 2023.

While anecdotal evidence and employment data suggest that some of those laid off have been rehired, layoffs picked up again in November 2023.



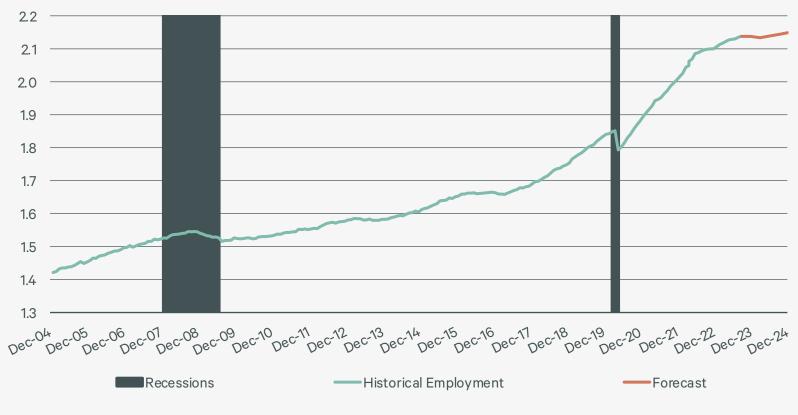




A limited amount of life sciences job losses is expected amid an economic slowdown in 2024 (Figure 17). A modest 0.2% drop in life sciences employment in the first half of 2024, followed by mild growth in the second half, should ultimately result in higher life sciences employment at the end of 2024 than in 2023. By comparison, total life sciences employment during the Global Financial Crisis fell by 6.3% and took three years to recover.

FIGURE 17: Total U.S. Life Sciences Employment Forecast

Millions



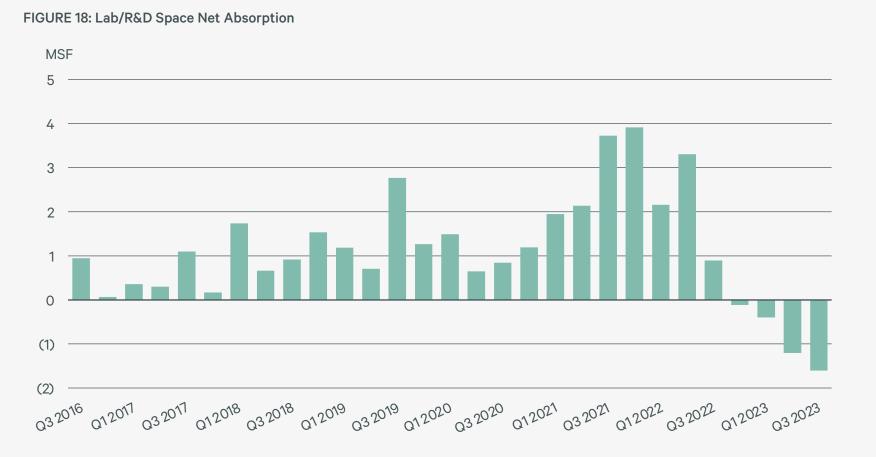
Source: U.S. Bureau of Labor Statistics, CBRE Research, Oxford Economics, Q4 2023.

04 Supply & Demand Trends

Sluggish capital markets, high interest rates, slowing economic growth and record-high supply of new lab/R&D space will be challenging for life sciences markets in 2024.

As demand for space returns to prepandemic averages, construction deliveries should peak in 2024, which will increase the overall vacancy rate and lower the average rent. The construction pipeline should drop dramatically in 2025, allowing property markets to stabilize amid more leasing activity.

Net absorption of lab/R&D space turned negative in 2023, particularly in the top three life sciences markets of Boston-Cambridge, the San Francisco Bay Area and San Diego. These markets had a much faster inflow of venture capital funding between 2019 and 2021 (+170%) than the 10 other primary markets (+82%), possibly leading to more risk-taking, misallocation of capital and overzealous expansion plans. Significantly higher amounts of new construction also occurred in these markets.

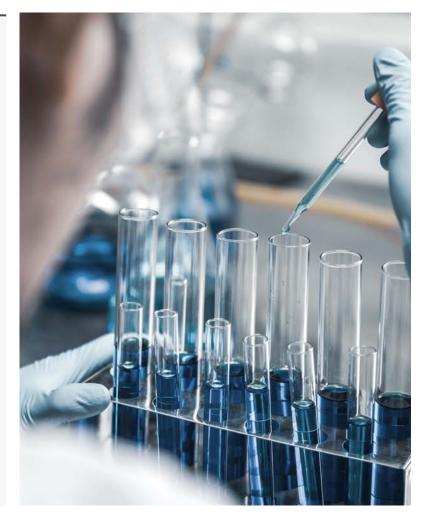


Source: CBRE Research, Q4 2023.

Tenant requirements for lab/R&D space in seven key markets—though down considerably from the peak in 2021—are roughly consistent with the prepandemic average between 2016 and 2019. However, the supply of new space has skyrocketed by 345% from the pre-pandemic average (Figure 19). These supply-and-demand dynamics are expected to prevail in 2024.

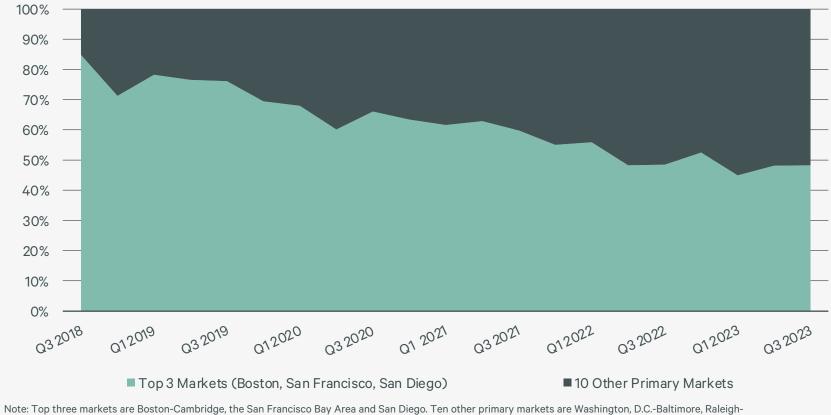


Source: CBRE Research, Q4 2023.



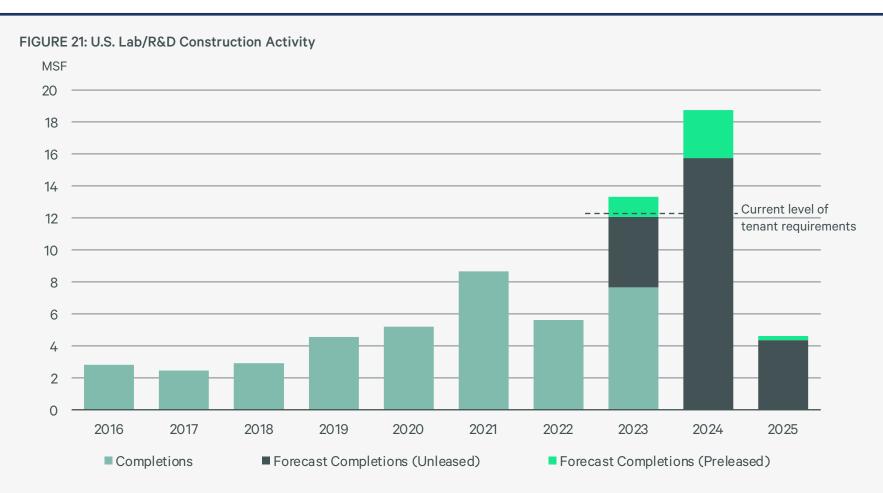
Tenant requirements for lab/R&D space have fallen more sharply in the top three life sciences markets (-58%) than in the other 10 primary markets (-45%) since the peak in late 2021. The share of tenants' lab/R&D space requirements in the top three markets hit its lowest level in the past five years in 2023 (Figure 20). Increased requirements for the 10 other primary markets underscores how mature and robust they have become as life sciences centers.



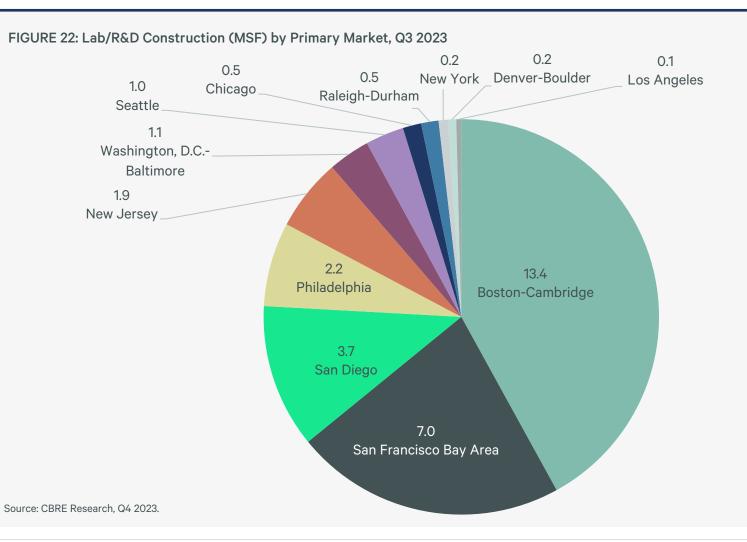


Note: Top three markets are Boston-Cambridge, the San Francisco Bay Area and San Diego. Ten other primary markets are Washington, D.C.-Baltimore, Raleigh-Durham, Philadelphia, Seattle, New Jersey, New York City, Chicago, Los Angeles, Denver-Boulder and Houston. Source: CBRE Research, Q4 2023. Construction completions of new and converted lab/R&D space in 2024 are expected to exceed the record 13.3 million sq. ft. of completions in 2023 (Figure 21) by more than 5 million sq. ft. In 2025, completions should fall dramatically to less than 5 million sq. ft., the lowest total since 2019.

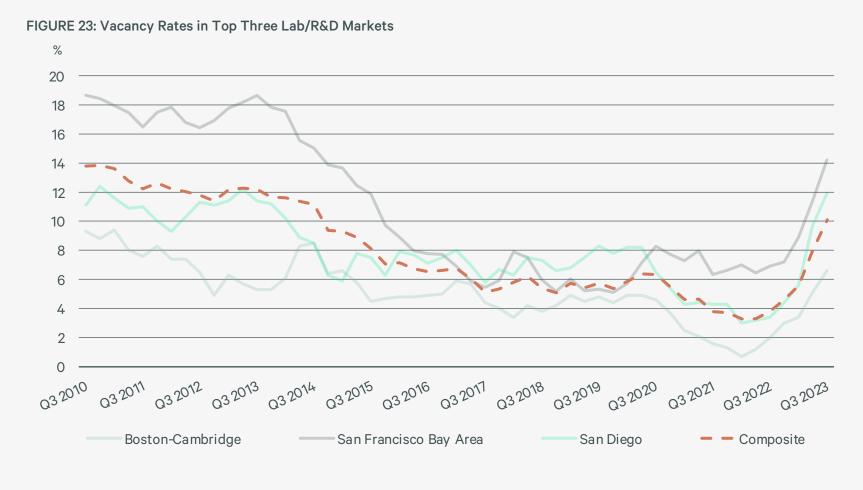




Note: Includes speculative and excludes build-to-suit projects and a small number of properties without an estimated delivery date. Source: CBRE Research, Q4 2023. More than 40% (13.4 million sq. ft.) of lab/R&D space scheduled for delivery over the next two years is in the top market of Boston-Cambridge (Figure 22), followed by 7 million sq. ft. in the San Francisco Bay Area and 3.7 million sq. ft. in San Diego for a combined share of 76%.



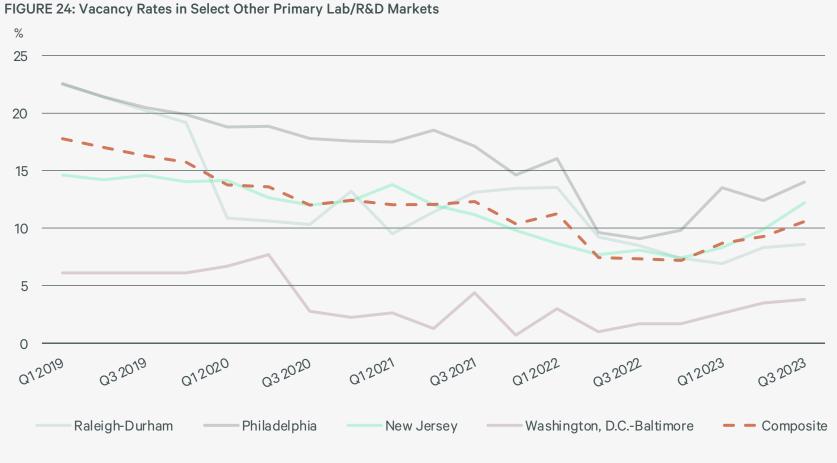
The large amount of new space currently under construction has caused vacancy rates to increase sharply in the top three life sciences markets (Figure 23). The overall vacancy rate for these top three markets increased to 10.1% in Q3 2023 from 3.3% in Q1 2022 and should head higher in 2024.



Source: CBRE Research, Q4 2023.

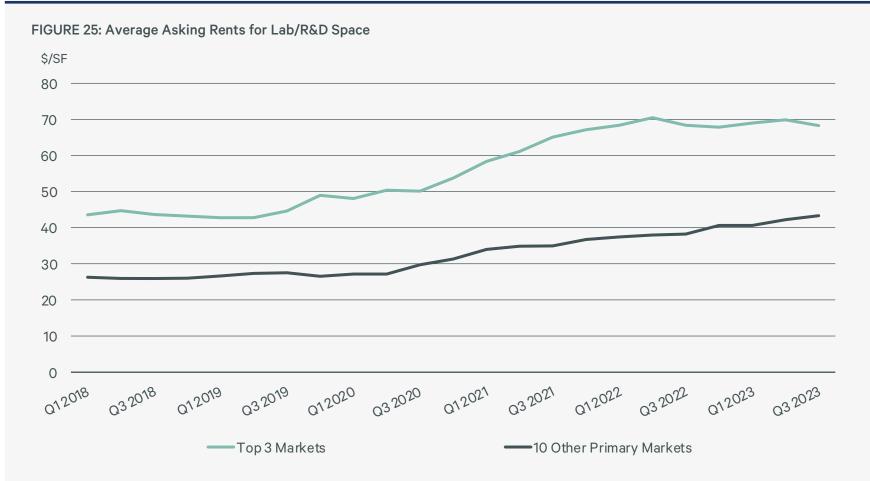
More moderate increases in vacancy have occurred in certain other primary markets. A composite vacancy rate for Washington, D.C.-Baltimore, Raleigh-Durham, Philadelphia and New Jersey increased to 10.6% in Q3 2023 from a low of 7.2% in Q4 2022 (Figure 24).

Although primary markets have a smaller pipeline of new supply, their vacancy rates likely will increase in 2024 due to high interest rates, an economic slowdown and sluggish capital markets.



Source: CBRE Research, Q4 2023.

Average asking rent for lab/R&D space in the top three life sciences markets declined by 0.1% for the year ending Q3 2023., compared with a 13.2% increase for the 10 other primary markets, due to more moderate supply growth and vacancy increases. As supply grows and vacancy increases in 2024, average asking rents across all markets should decrease moderately.



Source: CBRE Research, Q4 2023. Primary markets include Washington, D.C.-Baltimore, Raleigh-Durham, Philadelphia, Seattle, New Jersey, New York City, Chicago, Los Angeles, Denver-Boulder, and Houston.

Despite a surge of new supply in 2024, there are signs that demand should improve with recent increases in venture capital funding.

Total leasing volume of lab/R&D space in Boston-Cambridge and the San Francisco Bay Area, for example, shows the typical two quarter lag between an increase in venture capital funding and an increase in demand (Figure 26).

The recent slight uptick in venture capital funding may result in a near-term modest rebound in leasing activity, helping these markets navigate a challenging 2024. On the other hand, lower funding in Q4 2023 may temporarily dampen that momentum.

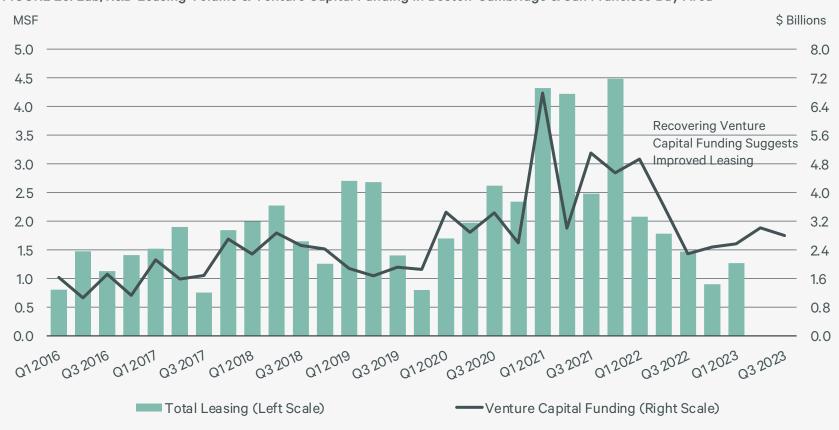


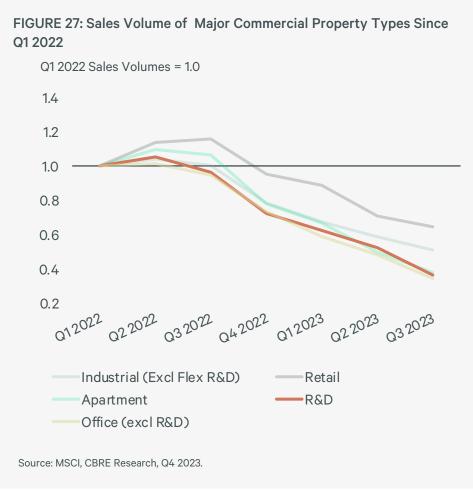
FIGURE 26: Lab/R&D Leasing Volume & Venture Capital Funding in Boston-Cambridge & San Francisco Bay Area

Note: Two-quarter lag in direction of total leasing activity with that of total venture capital funding. Source: CBRE Research, CBInsights. Q4 2023

05 Real Estate Investment Activity

High interest rates have greatly tempered the investment sales market for R&D property types, including life sciences. R&D investment volume has dropped by 64% since Q1 2022, when the Federal Reserve began its interest rate increases.

Retail properties have been better able to navigate this high interest rate environment, with a relatively modest 36% decline in investment volume since Q1 2022, while office buildings (excluding R&D) have faced the biggest drop of 66%.



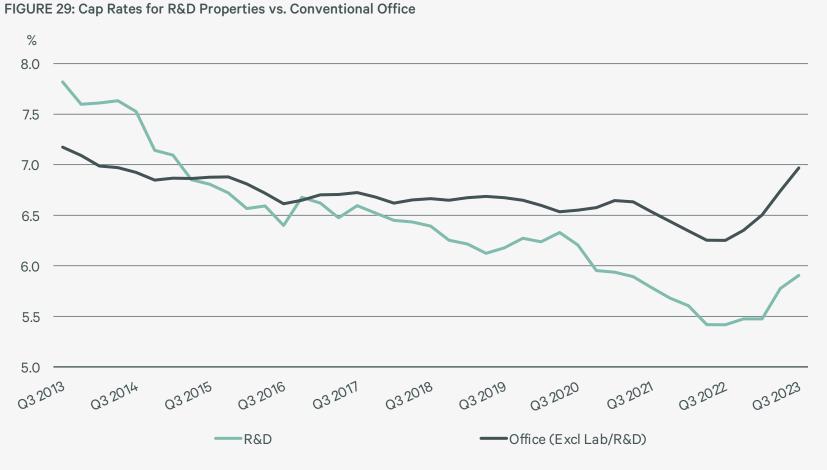


The San Francisco metro area has seen the biggest decline in R&D property sales (-85%) since their peak in Q3 2021. Sales volume in the two other top three markets (Boston-Cambridge and San Diego) are down by 70% and 66%, respectively.

Sales volume in the 10 other primary markets has fallen by a lesser rate of 58%. The outlook for sales volume in 2024 will greatly depend on the path of interest rates.



The average capitalization rate for R&D properties has risen by 50 basis points (bps) since mid-2022 to 5.9% in Q3 2023. By comparison, the average cap rate for conventional office properties (excluding R&D) has jumped by 70 bps to 7.0% over the same time. Cap rates may remain elevated in 2024 if interest rates stay high.





Source: MSCI, CBRE Research, Q4 2023.

The U.S. life sciences market is facing several risks in 2024, including the possibility of continued high interest rates, persistent inflation, geopolitical conflicts and a presidential election. However, a likely end of the Fed's rate-hiking cycle may result in more investment activity but lower values, ultimately causing another relatively sluggish year for commercial real estate investment sales (Figure 30).



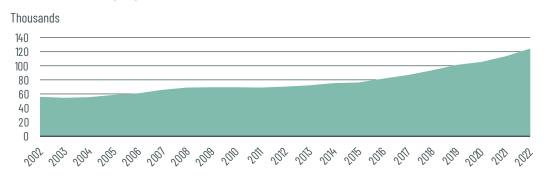
FIGURE 30: Historical & Forecast U.S. Commercial Real Estate Investment Volume

Source: MSCI, CBRE Research, Q4 2023.

06 Market Profiles

Boston-Cambridge

Life Sciences Employment



Source: U.S. Bureau of Labor Statistics, CBRE Research

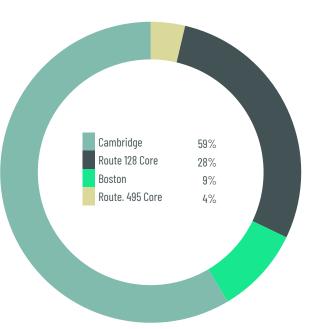




Historical Vacancy & Asking Rate



2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket



Boston-Cambridge

2023 Lab/R&D Market Statistics as of Q3

2023 Lab/R&D Sale Transactions

Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	Demand (SF)	1st Generation, New Lease TIA	2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$		
55,883,261	\$95.97	6.6%	(684,640)	2,140,000	\$200-\$275	\$20-50	6	2,495,651	\$1,817,412,000		
Lab R&D Future Su	ab R&D Future Supply (Q3 2023)										
Under Co	onstruction	Number of P	rojects	Total Size (SI	[•])	Total Spec Size (SF)		% Pre-lea	sed		
Ν	lew	39		11,556,468		9,061,468		32.0%			
Conv	version	23		4,299,116		4,299,116		19.5%			
Te	otal	62		15,855,584		13,360,584		28.6%			

Top 5 Lab/R&D Lease Transactions of 2023

Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q1	SmartLabs	Cambridge - East	172,000	New	Direct
Q2	Orbital Therapeutics	Cambridge - East	166,000	New	Sublease
Q2	Novartis Pharmaceutical Corporation	Cambridge - East	99,800	Renewal	Direct
Q2	Astellas Pharmaceuticals (Ocata/ACT)	Cambridge - East	62,900	New	Direct
Q3	Voyager Therapeutics	Route 128 – West	61,300	Expansion	Direct

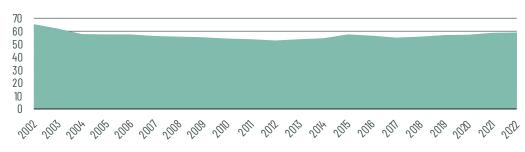
Lab/R&D Lease Transaction Breakdown

	I	Direct		lease	Total		
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals	
New	759,474	28	504,606	21	1,264,080	49	
Renewal	700,084	12		-	700,084	12	
Expansion	133,833	4		-	133,833	4	
Renewal/Expansion	78,409	2		-	78,409	2	
Grand Total	1,671,800	46	504,606	21	2,176,406	67	

Chicago

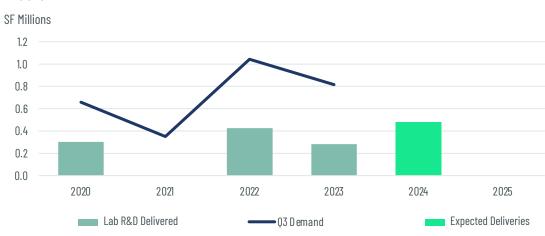
Life Sciences Employment

Thousands



Source: U.S. Bureau of Labor Statistics, CBRE Research





Historical Vacancy & Asking Rate



2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket



2023 Lab/R&D Sale Transactions

Chicago

2023 Lab/R&D Market Statistics as of Q3

ation, TIA	Count	Total Sq. Ft.	Total \$
	0	0	\$0
	e TIA	Count	Count I otal Sq. Fl.

Lab R&D Future Supply (Q3 2023)

Under Construction	Number of Projects	Total Size (SF)	Total Spec Size (SF)	% Pre-leased
New	2	479,963	479,963	11.5%
Conversion	-	-	-	-
Total	2	479,963	479,963	11.5%

Top 5 Lab/R&D Lease Transactions of 2023

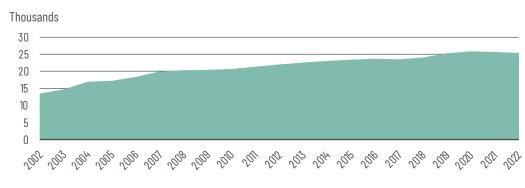
Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q2	Bristol Myers Squibb*	Suburbs	166,800	New	Direct
Q1	University of Chicago	City	55,000	New	Direct
Q2	Charles River Laboratories	Suburbs	45,000	Renewal	Direct
Q3	Confidential	City	35,000	New	Direct
Q4	Illinois Institute of Technology	City	34,300	New	Direct
Q2	Chan Zuckerberg Biohub Chicago	City	28,200	New	Direct
*Lab/Office and GMP					

Lab/R&D Lease Transaction Breakdown

	Direct		Sub	lease	Total		
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals	
New	380,497	10	-	-	380,497	10	
Renewal	45,000	1	-	-	45,000	1	
Expansion	6,000	1	-	-	6,000	1	
Renewal/Expansion	-	-	-	-	-	-	
Grand Total	431,497	12	-	-	431,497	12	

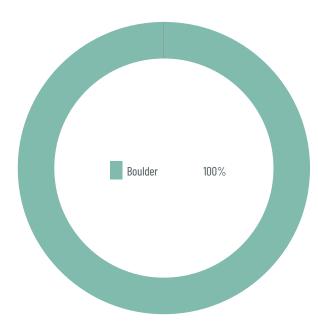
Denver-Boulder

Life Sciences Employment





2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket



Source: U.S. Bureau of Labor Statistics, CBRE Research



Supply & Demand SF Millions 1.6 1.4 1.2 10 0.8 0.6 0.4 0.2 0.0 2020 2021 2022 2023 2024 2025 Expected Deliveries

------ 03 Demand

Lab R&D Delivered

Denver-Boulder

2023 Lab/R&D	Market Statistics as of Q3	2023 Lab/R&	Sale Transactions						
Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	orption Demand (SF) New Lease	1st Generation, New Lease TIA	2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
3,122,217	\$60.00	8.5%	120,704	450,000	\$160-200	N/A	1	404,159	\$188,000,000

Lab R&D Future Supply (Q3 2023)

Under Construction	Number of Projects	Total Size (SF)	Total Spec Size (SF)	% Pre-leased
New	1	60,000	60,000	0.0%
Conversion	6	158,103	158,103	33.1%
Total	7	214,103	214,103	24.4 %

Top 5 Lab/R&D Lease Transactions of 2023

Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q2	Corden	Boulder	61,100	New	Direct
Q3	Novo Nordisk	Boulder	41,100	Expansion	Direct
Q1	Think Bioscience	Boulder	11,200	New	Direct
Q1	Edgewise	Boulder	8,000	Expansion	Direct
Q3	Undisclosed	Northwest	6,870	New	Direct

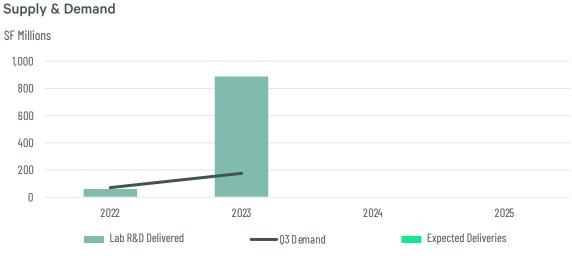
Lab/R&D Lease Transaction Breakdown

	Dire	ct	Sub	lease	Tota	1
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	91,754	6	-	-	91,754	6
Renewal	30,250	1	-		30,250	1
Expansion	54,167	3	-	-	54,167	3
Renewal/Expansion	-	-	-	-	-	-
Grand Total	176,171	10	-	-	176,171	10

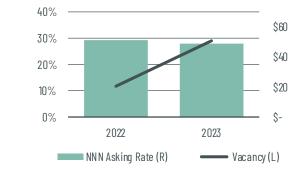
Houston

Source: U.S. Bureau of Labor Statistics, CBRE Research

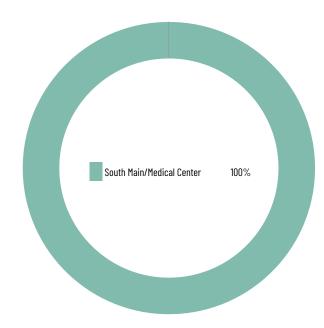




Historical Vacancy & Asking Rate



2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket



Houston

2023 Lab/R&D Market Statistics as of Q3

2023 Lab/R&D Sale Transactions

Inventory (SF)	Owner-User Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	Demand (SF)	1st Generation, New Lease TIA	2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
2,822,810	170,765	\$48.87	29.0%	28,000	175,000	\$150.00	N/A	0	0	\$0

Lab R&D Future Supply (Q3 2023)

Number of Projects	Total Size (SF)	Total Spec Size (SF)	% Pre-leased
-	-	-	0.0%
-	-	-	0.0%
-	-	-	0.0%
	Number of Projects - - -	Number of Projects Total Size (SF) - - - - - - - - - -	Number of Projects Total Size (SF) Total Spec Size (SF) - - - - - - - - - - - - - - - - - -

Top 5 Lab/R&D Lease Transactions of 2023

Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q1	Baylor College of Medicine	South Main/Medical Center	115,000	New	Direct
Q2	Portal Innovations	South Main/Medical Center	30,000	New	Direct
Q3	Undisclosed	South Main/Medical Center	30,000	New	Direct
Q3	Systemic Bio	South Main/Medical Center	15,900	New	Direct
Q3	VenoStint	South Main/Medical Center	12,500	New	Direct

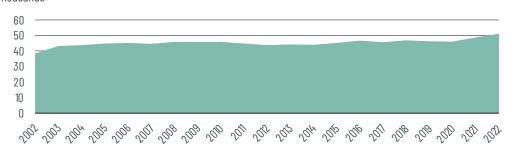
Lab/R&D Lease Transaction Breakdown

	Dire	ct	Sub	lease	Tota	1
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	203,400	5	-	-	203,400	5
Renewal	-	-	-	-	-	-
Expansion	-	-	-	-	-	-
Renewal/Expansion	_	-	-	-	-	-
Grand Total	203,400	5	-	-	203,400	5

Los Angeles

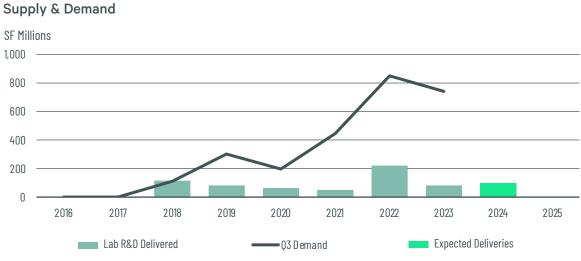
Life Sciences Employment

Thousands

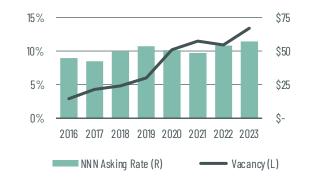


Source: U.S. Bureau of Labor Statistics, CBRE Research

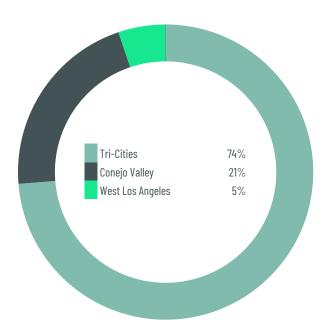




Historical Vacancy & Asking Rate



2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket



Los Angeles

2023 Lab/R&D Market Statistics as of Q3

2023 Lab/R&D Sale Transactions

Inventory (SF)	Owner-User Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	Demand (SF)		2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
5,916,222	4,900,791	\$57.18	13.4%	1,195	741,500	\$185	\$150	2	217,679	\$37,025,000

Lab R&D Future Supply (Q3 2023)

Under Construction	Number of Projects	Total Size (SF)	Total Spec Size (SF)	% Pre-leased
New	4	291,000	-	0.0%
Conversion	2	129,287	129,287	0.0%
Total	6	420,287	129,287	0.0%

Top 5 Lab/R&D Lease Transactions of 2023

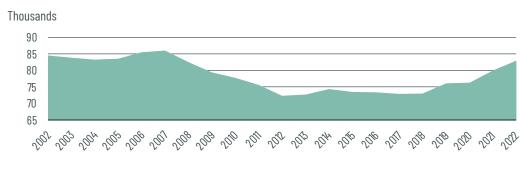
Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q3	Confidential	Tri-Cities	12,000	New	Direct
Q3	Acurastem	Tri Cities	5,000	New	Direct
Q3	Early DX	Conejo Valley	4,860	New	Direct
Q2	Confidential	West Los Angeles	815	New	Direct
Q2	Confidential	West Los Angeles	380	New	Direct

Lab/R&D Lease Transaction Breakdown

	Dire	Sub	lease	Total		
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	23,058	5	-	-	23,058	5
Renewal	-	-	-	-	-	-
Expansion	-	-	-	-	-	-
Renewal/Expansion	-	-	-	-	-	-
Grand Total	23,058	5	-	-	23,058	5

New Jersey

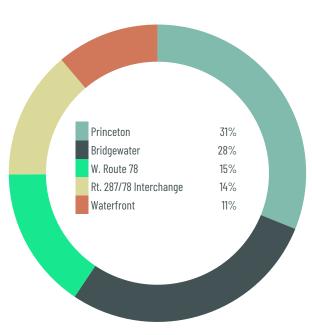
Life Sciences Employment



Historical Vacancy & Asking Rate



2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket

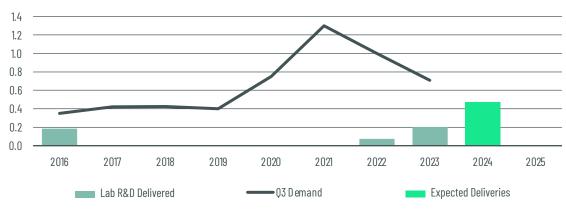


Source: U.S. Bureau of Labor Statistics, CBRE Research



Supply & Demand

SF Millions



New Jersey

2023 Lab/R&D Market Statistics as of Q3

2023 Lab/R&D Sale Transactions

Inventor (SF)	y Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	Demand (SF)	1st Generation, New Lease TIA	2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
17,519,200	\$36.00	12.2%	(460,793)	710,000	\$50	\$20	2	1,950,150	\$195,200,000

Lab R&D Future Supply (Q3 2023)

Under Construction	Number of Projects	Total Size (SF)	Total Spec Size (SF)	% Pre-leased
New	3	1,878,626	98,000	10.5%
Conversion	3	582,057	-	72.2%
Total	6	2,460,683	98,000	25.1 %

Top 5 Lab/R&D Lease Transactions of 2023

Quarter	Tenant Submarket		Size Type		Direct/Sublease
Q3	Ingredion	Bridgewater	150,000	Renewal	Direct
Q3	Reliable Healthcare	Princeton	138,400	New	Sublease
Q1	ROCHE Molecular Systems	W. Route 78	82,000	Renewal	Direct
Q2	Avantor Performance Materials	Rt. 287/78 Interchange	61,000	New	Direct
Q3	IAVI- International AIDS Vaccine Initiative	Waterfront	29,800	New	Direct

Lab/R&D Lease Transaction Breakdown

	Dire	Sub	lease	Total		
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	159,837	5	138,414	1	298,251	6
Renewal	232,000	2	-	-	232,000	2
Expansion	-	-	-	-	-	-
Renewal/Expansion	-	-	-	-	-	-
Grand Total	391,837	7	138,414	1	530,251	8

New York City

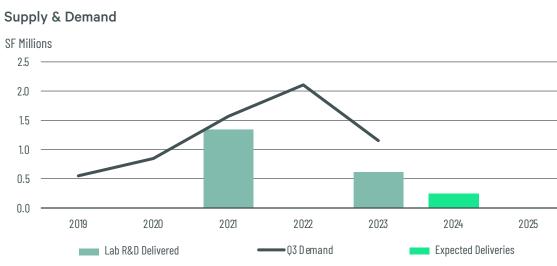






Source: U.S. Bureau of Labor Statistics, CBRE Research



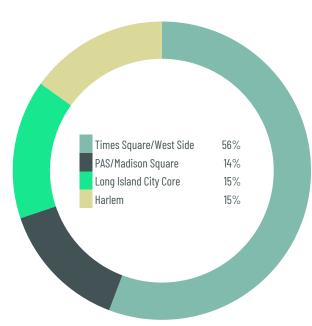


Historical Vacancy & Asking Rate**



**Stats are reflective of lab exclusive space only. *Pre-Built Vacancy Rate

2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket



New York City

2023 Lab/R&D Market Statistics as of Q3**

2023 Lab/R&D Sale Transactions

Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	Pre-Built Vacancy Rate	2023 Absorption	Demand (SF)	1st Generation, New Lease TIA	2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
3,039,245	\$100.76	36.4%	10.7%	(183,423)	1,153,000	\$175*	\$20	0	0	\$0
**Stats are refle	ective of lab exclusive spa	ce only.				*Spec equivalent va	lue			
Lab R&D Fi	uture Supply (Q3 20	023)	400 PSF.							

Under Construction	Number of Projects	Total Size (SF)	Total Spec Size (SF)	% Pre-leased
New	1	195,095	195,095	0.0%
Conversion	1	47,584	47,584	0.0%
Total	2	242,679	242,679	0.0%

Top Lab/R&D Lease Transactions of 2023

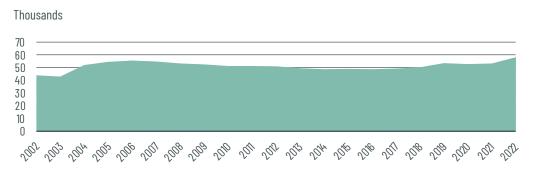
Quarter	Tenant	nt Submarket		Туре	Direct/Sublease
Q2	Graviton Biopharmaceutical Holdings Corp	Times Square/West Side	28,700	New	Direct
Q2	New York University	Long Island City Core	15,000	Expansion	Direct
Q3	Volastra Therapeutics	Harlem	15,000	Renewal	Direct
Q2	New York University	PAS/Madison Square	14,000	Expansion	Direct

Lab/R&D Lease Transaction Breakdown

	Dire	ct	Sub	lease	Tota	1
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	74,724	5	-	-	74,724	5
Renewal	15,000	1	-	-	15,000	1
Expansion	29,000	2	3,137	1	32,137	3
Renewal/Expansion	-	-	-	-	-	-
Grand Total	118,724	8	3,137	1	121,861	9

Philadelphia

Life Sciences Employment

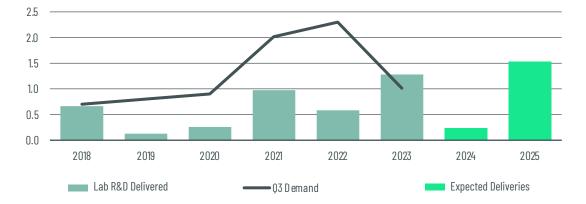


Source: U.S. Bureau of Labor Statistics, CBRE Research



Supply & Demand

SF Millions



30%

25%

20%

15%

10%

5%

0%

2018

Historical Vacancy & Asking Rate

2020

2019

NNN Asking Rate (R)

2021

2022

2023

2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket

\$60

\$50

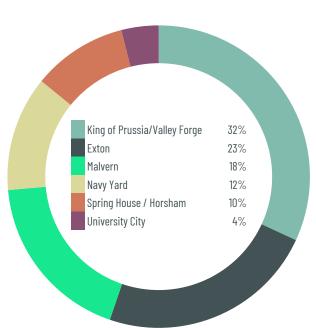
\$40

\$30

\$20

\$10

Ś-



23.4%

Philadelphia

2023 Lab/R&D Market Statistics as of Q3

2023 Lab/R&D Sale Transactions

2,189,943

Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	Demand (SF)	1st Generation, New Lease TIA	2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
11,049,702	\$50.15	14.0%	573,039	737,500	\$15-17	\$8-10	1	1,890,685	\$180,000,000
Lab R&D Futu	ure Supply (Q3 2023)								
Ur	nder Construction	Number of P	rojects	Total Size (SF)		Total Spec Size (SF)	% Pre-lea	sed
	New	4		1,285,796		1,285,796		20.4%	
	Conversion	9		904,147		904,147		27.6%	

2,189,943

13

Top 5 Lab/R&D Lease Transactions of 2023

Total

Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q1	Spark Therapeutics	King of Prussia/Valley Forge	63,000	New	Direct
Q2	Eisai	Exton	61,000	Renewal	Direct
Q3	Biocoat	Spring House / Horsham	37,500	Renewal	Direct
Q1	Invisible Sentinel	Navy Yard	32,200	New	Direct
Q1	Spark Therapeutics	University City	28,100	Renewal	Direct

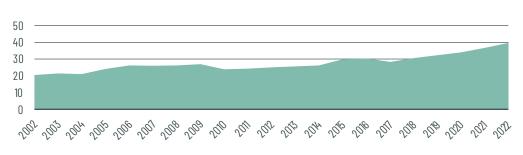
Lab/R&D Lease Transaction Breakdown

	Dire	st	Sub	lease	Tota	1
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	130,919	6	-	-	130,919	6
Renewal	174,548	5	-	-	174,548	5
Expansion	20,404	1	-	-	20,404	1
Renewal/Expansion	-	-	-	-	-	-
Grand Total	325,871	12	-	-	325,871	12

Raleigh-Durham

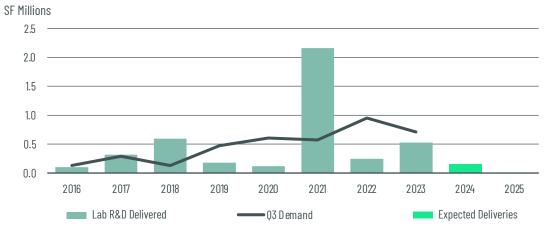
Life Sciences Employment

Thousands

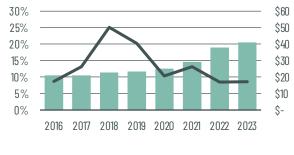


Source: U.S. Bureau of Labor Statistics, CBRE Research

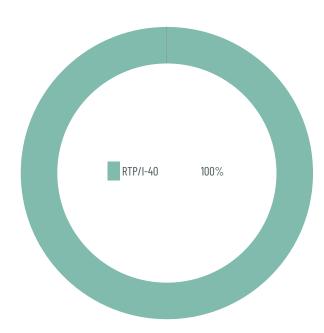




Historical Vacancy & Asking Rate



2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket



Raleigh-Durham

2023 Lab/R&D Market Statistics as of Q3

2023 Lab/R&D Sale Transactions

Inventory (SF)	Owner-User Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	Demand (SF)		2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
9,149,948	1,620,322	\$41.00	8.6%	62,039	708,700	\$175-200	\$100-150	1	165,774	\$113,000,000

Lab R&D Future Supply (Q3 2023)

Under Construction	Number of Projects	Total Size (SF)	Total Spec Size (SF)	% Pre-leased
New	4	465,366	452,366	2.8%
Conversion	-	-	-	-
Total	4	465,366	452,366	2.8%

Top 5 Lab/R&D Lease Transactions of 2023

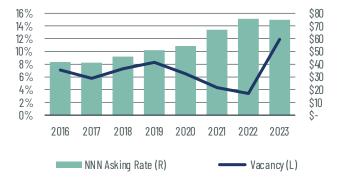
Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q1	AskBio	RTP/I-40	70,700	New	Direct
Q1	KBI BioPharma	RTP/I-40	39,000	Expansion	Sublease
Q3	ILS	RTP/I-40	30,000	Renewal	Direct
Q2	SpringWorks	RTP/I-40	15,000	New	Direct
Q1	Brightseed	RTP/I-40	12,000	New	Direct

Lab/R&D Lease Transaction Breakdown

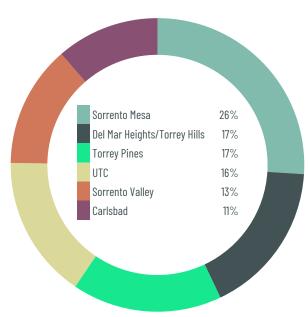
	Dire	ct	Sub	lease	Tota	1
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	117,693	6	-	-	117,693	6
Renewal	37,975	2	-	-	37,975	2
Expansion	10,465	1	38,984	1	49,449	2
Renewal/Expansion	-	-	-	-	-	-
Grand Total	166,133	9	38,984	1	205,117	10

San Diego

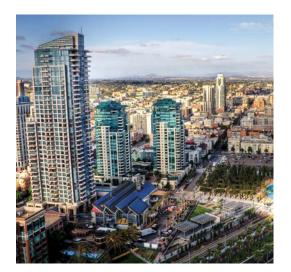
Historical Vacancy & Asking Rate



2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket

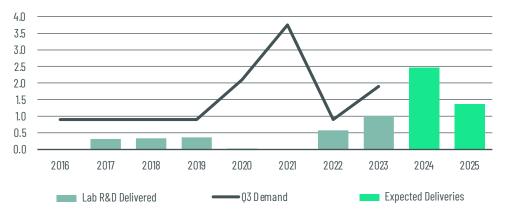


Source: U.S. Bureau of Labor Statistics, CBRE Research



Supply & Demand

SF Millions



San Diego

2023 Lab/R&D Marke	t Statistics as of Q3
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2023 Lab/R&D Sale Transactions

Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	Demand (SF)	1st Generation, New Lease TIA	2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
24,208,462	\$75.00	11.9%	(736,019)	1,900,000	\$250-300	N/A	4	316,566	\$293,761,860
	ure Supply (Q3 2023) nder Construction	Number of Pr	rojects	Total Size (SF)	,	Total Spec Size (SF))	% Pre-lea	sed
	New	11		4,773,470		3,741,470		24.5%	
	Conversion	0		0		0		0.0%	
	Total	11		4,773,470		3,741,470		24.5 %	

Top 5 Lab/R&D Lease Transactions of 2023

Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q1	Agilent	Torrey Pines	49,600	Renewal/Expansion	Direct
Q1	Bolt Medical	Carlsbad	47,000	New	Direct
Q3	ProciseDx	Sorrento Mesa	41,800	Renewal	Direct
Q3	Bavarian Nordic	Sorrento Mesa	30,900	Renewal	Direct
Q2	Precision Toxicology	Sorrento Valley	30,300	Renewal/Downsize	Direct

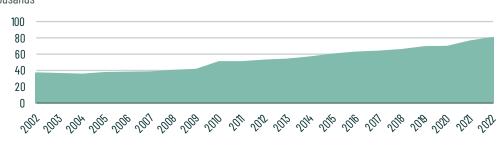
Lab/R&D Lease Transaction Breakdown

	Dire	ct	Sub	lease	Tota	d
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	219,555	19	48,827	5	268,382	24
Renewal	155,312	9	-	-	155,312	9
Expansion	32,715	3	-	-	32,715	3
Renewal/Expansion	49,582	1	-	-	49,582	1
Grand Total	457,164	32	48,827	5	505,991	37

San Francisco Bay Area

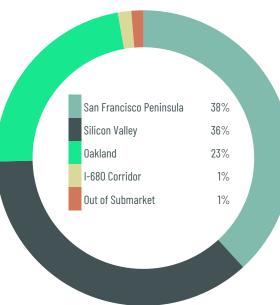
Life Sciences Employment







2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket





Supply & Demand SF Millions



San Francisco Bay Area

2023 Lab/R&D Ma	rket Statistics as of Q3
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2023 Lab/R&D Sale Transactions

Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	Demand (SF)	1st Generation, New Lease TIA	2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
36,976,489	\$71.16	14.2%	(1,648,126)	2,087,500	\$275	\$150	1	241,571	\$102,000,000
	ure Supply (Q3 2023) nder Construction	Number of Pr	niects	Total Size (SF)		Total Spec Size (SF)	% Pre-lea	sed
	New	1 (diliber of 1) 07	lojeetis	6,103,008		5,516,008	,	11.1%	jeu
	Conversion	15		1,521,546		1,521,546		8.1%	
	Total	42		7,624,554		7,037,554		10.5%	

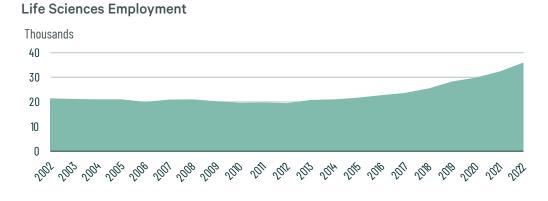
Top 5 Lab/R&D Lease Transactions of 2023

Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q1	Confidential	San Francisco Peninsula	142,800	Renewal/Expansion	Direct
Q2	Confidential	Oakland	121,200	Renewal/Expansion	Direct
Q1	Confidential	Silicon Valley	118,300	Renewal	Direct
Q1	Intuitive Surgical, Inc.	Silicon Valley	104,200	Renewal	Direct
Q3	Pliant Health Care	South San Francisco	100,900	New	Direct

Lab/R&D Lease Transaction Breakdown (10K SF +)

	Dire	ct	Sub	lease	Tota	1
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	928,170	38	115,941	6	1,044,111	44
Renewal	752,275	22	-	-	752,275	22
Expansion	131,340	4	-	-	131,340	4
Renewal/Expansion	348,543	3	-	-	348,543	3
Grand Total	2,160,328	67	115,941	6	2,276,269	73

Seattle



Source: U.S. Bureau of Labor Statistics, CBRE Research



Supply & Demand



Historical Vacancy & Asking Rate

NNN Asking Rate (R)

2017 2018 2019 2020 2021 2022 2023

14%

12%

10%

8%

6%

4%

2%

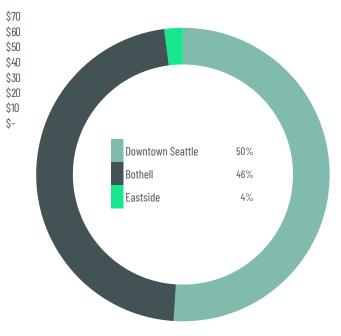
0%

2016

2023 R&D/Lab Leases Over 10,000 sq. ft. by Submarket

Ś-

Vacancy (L)



45.0%

Seattle

2023 Lab/R&	D Market Statistics as of Q3						2023 Lab/R&	D Sale Transactior	าร
Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	Demand (SF)	1st Generation, New Lease TIA	2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
8,522,174	\$68.53	8.0%	6,950	315,000	\$200-220	\$35-55	0	0	\$0
Lab R&D Futu	Lab R&D Future Supply (Q3 2023)								
Ur	nder Construction	Number of P	rojects	Total Size (SF)	Total Spec Size (SI	F)	% Pre-leas	ed
	New	5		1,045,451		804,500		41.5%	
	Conversion	2		277,179		199,179		58.4%	

7

1,322,630

1,003,679

Top 5 Lab/R&D Lease Transactions of 2023

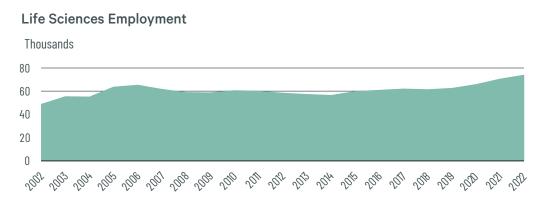
Total

Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q1	Bristol-Myers Squibb Co.	Seattle Close-In	267,000	Renewal	Direct
Q2	Confidential	Downtown Seattle	31,300	New	Direct
Q2	Biocontrol Systems	Eastside	25,500	Renewal	Direct
Q3	Curevo	Bothell	13,600	New	Direct
Q3	Pliant Health Care	Seattle Close-In	8,840	Renewal	Direct

Lab/R&D Lease Transaction Breakdown

	Dire	ct	Sub	please	Tota	ıl
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	81,076	4	5,659	2	86,735	6
Renewal	564,608	8	-	-	564,608	8
Expansion	-	-	-	-	-	-
Renewal/Expansion	-	-	-	-	-	-
Grand Total	645,684	12	5,659	2	651,343	14
		IZ	5,659	۷	031,343	14

Washington, D.C.



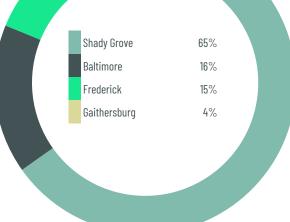
Source: U.S. Bureau of Labor Statistics, CBRE Research











SF Millions



Washington, D.C.

2023 Lab/R&D Market	Statistics as of Q3
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2023 Lab/R&D Sale Transactions

Inventory (SF)	Average Asking Rents (NNN)	Vacancy Rate	2023 Absorption	Demand (SF)	1st Generation, New Lease TIA	2nd+ Generation, New Lease TIA	Count	Total Sq. Ft.	Total \$
12,919,466	\$43.50	3.8%	288,383	402,500	\$175	\$20	0	0	\$0
	ure Supply (Q3 2023)		• ,						,
Ur	nder Construction	Number of P	rojects	Total Size (SF))	Total Spec Size (SF))	% Pre-leas	sed
	New	6		936,666		460,166		60.3%	
	Conversion	6		624,690		624,690		16.2%	
	Total	12		1,561,356		1,084,856		42.7 %	

Top 5 Lab/R&D Lease Transactions of 2023

Quarter	Tenant	Submarket	Size	Туре	Direct/Sublease
Q1	MacroGenics	Shady Grove	122,600	Renewal	Direct
Q2	Confidential	Shady Grove	85,000	New	Direct
Q1	UMB	Baltimore	60,000	New	Direct
Q1	Qiagen	Frederick	43,000	Renewal	Direct
Q1	Qiagen	Frederick	34,500	New	Direct

Lab/R&D Lease Transaction Breakdown

	Direct		Sublease		Total	
Deal Type	Sq Ft.	# of Deals	Sq. Ft.	# of Deals	Sq. Ft.	# Deals
New	28,195	5	-	-	28,195	5
Renewal	188,291	3	-	-	188,291	3
Expansion	220,688	10	19,342	2	240,030	12
Renewal/Expansion	77,500	1	7,300	1	84,800	2
Grand Total	514,674	19	26,642	3	541,316	22

Contacts

Richard Barkham

Matt Gardner

Global Chief Economist &

Global Head of Research

richard.barkham@cbre.com

Head of Life Sciences Americas

matt.gardner@cbre.com

Julie WhelanIan AndersonGlobal Head of Occupier Thought LeadershipSenior Director of Researchjulie.whelan@cbre.comian.anderson@cbre.com

Taylor Lee Associate Research Director taylor.lee@cbre.com Suzanne Duca Director of Research suzanne.duca@cbre.com

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