



United States | 2020

Research

2020 Life Sciences Real Estate Outlook

Fueling biopharma and med device innovation

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JLL's 2020 U.S. Life Sciences Outlook supplies new insight into how current innovation, operations and investment trends—combined with COVID-19-related adaptations—are influencing the life sciences industry as well as the real estate that supports its dynamism.

Our annual cluster ranking profiles the top U.S. life sciences hubs and tracks the progress of the up-and-coming life sciences markets that are fast becoming options of choice for life sciences companies and investors alike. Finally, the outlook introduces prominent industry trends that will provide new engines of growth.

In this report

In addition to highlighting the current state of life sciences real estate clusters across the U.S., this report will provide answers to three critical questions that both life sciences companies and lab developers must consider in order to remain at the crest of industry trends.



1.

How do we foster innovation through real estate?

Simply put, innovation is enabled by enhanced speed-to-market in order to produce, test and improve pharmaceutical development. For this reason, companies need access to Good Manufacturing Practices (GMP) facilities to facilitate small-batch drug production and shorten the supply chain.

2.

How do we heighten productivity?

The most obvious answer to this question is the recruitment and retention of top talent, and real estate plays a pivotal role in this endeavor. Life sciences companies will evolve the lab of the future, or what we call next-gen labs, to accommodate future demand, including: 1) bifurcated locations or remote work for administrative divisions, 2) increased technology adoption and the use of computational labs, 3) reshored supply chains for faster profitability and sustainability.

3.

How do we adapt to more acute consumer and patient needs?

There are two ways the life sciences industry can continue to meet consumer and patient needs: continued capital investment and regulatory advances. The desire for good health and increased longevity can only rise, increasing demand for cutting-edge, productivity-enhancing life sciences real estate.

2020 cluster rankings

In 2020, the top-ranked clusters, Boston, San Francisco and San Diego, retained their rankings as the clear leaders among the U.S. life sciences ecosystems, remaining the top contenders for venture capital investment. In fact, these three clusters captured 70 percent of all venture capital investment for 2019. Venture capital is the wellspring of life sciences real estate demand, as it guarantees long-term activity in an industry that requires a substantial amount of research and development prior to revenue generation. This initial infusion of capital is critical to space demand. Therefore, it's no surprise that Boston and San Francisco also lead the other clusters significantly with respect to development, with 2.7 million square feet (m.s.f.) and 4.0 m.s.f., respectively, under construction; San Diego is not far behind with 1.0 million s.f. in the pipeline. The concentration of talent, academic prowess and influx of state-of-the-art new supply allowed Boston, San Francisco and San Diego to command year-over-year rent growth in the high single and double digits, depending on submarket, in 2020.

Thanks to the increasing vibrancy of the life sciences industry nationwide, the strength of the Boston and San Francisco life sciences real estate markets has not precluded the growing strength of newer hotspots. New

York, Los Angeles and Philadelphia have all increased their cluster scores since 2019, reaching new peaks in venture capital funding and life sciences employment. As speed to market accelerates for many pharmaceuticals, proximity to incubators at major research institutions has supported developing clusters such as Raleigh-Durham, Houston and Maryland, which have attracted recent interest from developers such as ARE, Longfellow and Hines. The race for development and distribution of COVID-19-related tests, therapeutics and vaccines is already beginning to energize demand in pharma-heavy New Jersey, a trend that should spread to more markets as 2020 progresses. Indeed, because many primary life sciences markets are also tech hubs, available space is subject to demand from both industries, pushing overflow life sciences demand to rising secondary markets.

Each cluster has a different specialty and occupies its own point along the maturity spectrum, providing a diverse range of options for investors and occupiers alike. However, each cluster shares two factors: a highly educated workforce and ties to the research community, which in turn attracts a steady stream of multi-sourced investment that creates a need for institutional real estate.

Rank	Cluster	Weighted score
1	Greater Boston Area	89.0
2	San Francisco Bay Area	73.3
3	San Diego Metro Area	57.3
4	Maryland	52.2
5	Raleigh-Durham Metro Area	49.7
6	Philadelphia Metro Area	49.5
7	New York Metro Area	43.7
8	Los Angeles/Orange County	42.5
9	Seattle Metro Area	33.4
10	New Jersey	30.6
11	Houston	29.1
12	Denver Metro Area	28.8
13	Chicago Metro Area	22.3
14	Minneapolis-St. Paul Metro Area	16.3

Methodology	
Life sciences employment concentration: Weight: 20.0% Measured as the percent of industry employment against total metro private employment. (EMSI, 2019)	Life sciences establishments concentration: Weight: 10.0% Measured as the percent of industry establishments against total metro private establishments. (EMSI, 2019)
Life sciences venture capital funding: Weight: 15.0% Funding from 2019 (Crunchbase)	Life sciences National Institutes of Health funding: Weight: 10.0% (National Institutes of Health, 2019)
Total lab supply: Weight: 15.0% Life sciences employment growth: Weight: 10.0%	Market occupancy rate: Weight: 10.0% Average asking rent (NNN): Weight: 10.0%

Emerging trends:

Three priorities to consider for life sciences companies

The life sciences industry has traditionally offered an interesting paradox—though it is built on innovation, trends take years to fully manifest. However, over the past few months, the global race to develop COVID-19 tests, therapeutics and vaccines has necessitated rapid adaptation, both in activity and working environment. Though it has experienced COVID-19-related operational challenges, the life sciences industry is one of relatively few to benefit from pandemic-related tailwinds. Along with its direct effect on life sciences activity, COVID-19 has also rendered other underlying conditions more serious, intensifying already-strong consumer demand for products enabling longer, healthier lifespans. The past several months revealed the critical role of the life sciences industry within our national and global economy. Real estate in turn will play an essential role in maximizing the efficiency and results of life sciences real estate. Pharmaceutical, biotechnology and medical device companies can take action by answering the following questions:

1.

How do we foster innovation through real estate?

Life-enhancing pharmaceuticals and medical devices have been increasingly sought out not just by the aging baby boomer cohort but by millennials reaching the peak of their earning potential and choosing to spend more on tailored, personalized care. On the supply side, the upcoming expiration of a suite of patents creates an opportunity for mid-tier life sciences companies to pursue new long-term profit sources. Conditions are ideal for maximum profitability arising from innovative new pharmaceuticals and medical devices, and indeed, discovery and development of new transformative therapies for a wide range of conditions is booming. Both large, established companies and start-ups are intensely invested in research and development (R&D) for pharmaceuticals and medical devices alike. Many of the new products are curative rather than therapeutic, increasing their marketing potential. Meaningful advances within the life sciences industry, such as machine learning,

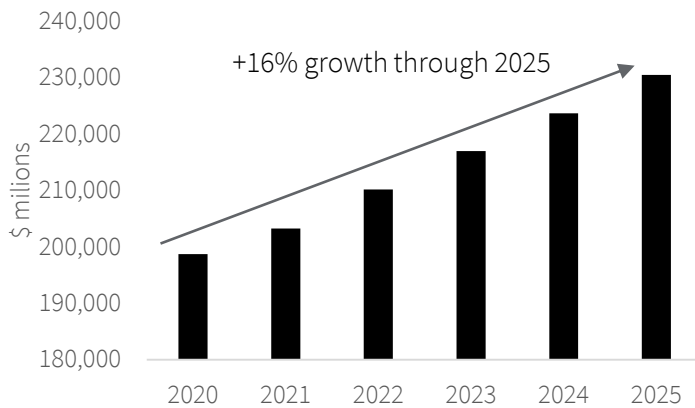
are creating new momentum, driving workflow and thus real estate demand. This combination of stimulative factors sets up the life sciences industry to expand at an unprecedented pace, in terms of both manufacturing and patient demand.

Telehealth and medical devices

The explosive growth of telehealth during the COVID-19 pandemic has generated many headlines based on its effect on the healthcare sector. However, telehealth is also a game-changer for medical devices. As the remote care comfort level of both practitioners and patients increases, it creates momentum for development of a suite of home-based devices, particularly for elderly and/or high-risk patients. For more information on telehealth, read our 2020 Healthcare Real Estate Outlook.

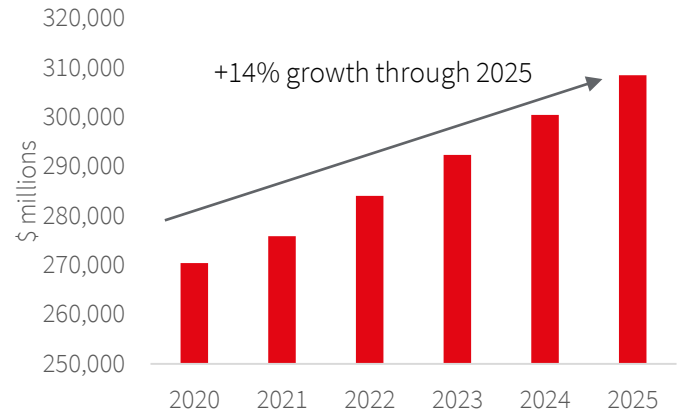


Robust growth forecast for brand-name pharmaceutical manufacturing



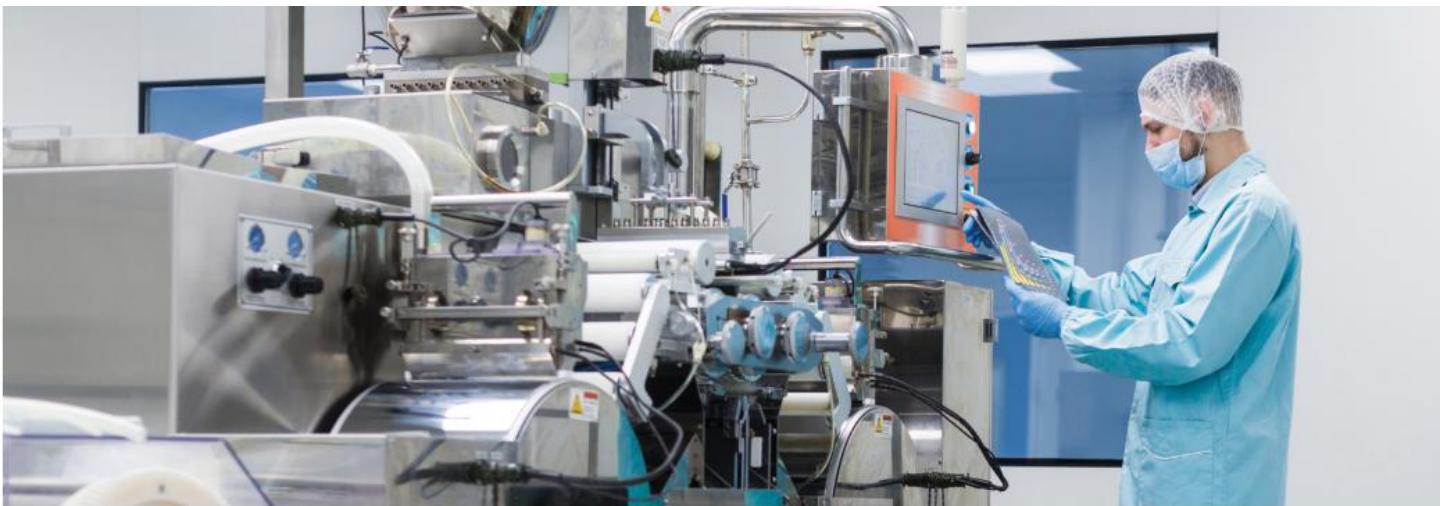
Source: IBISWorld

Domestic demand for pharmaceuticals to keep pace with supply



Source: IBISWorld

Life sciences employment has been steadily growing in the major cluster markets, a positive for innovation potential. However, real estate development occurs on a much slower timeline, and finding space that is appropriately equipped for large-scale research, development and production is crucial to success. **For this reason, industry innovation depends on quick and efficient access to Good Manufacturing Practices (GMP)–compliant facilities.**



GMP space. Source: International Society for Pharmaceutical Engineering

The term Good Manufacturing Practices refers to an ever-evolving set of FDA regulations governing the safety, sanitation and quality-control procedures involved in the production, processing and packaging pharmaceuticals and medical devices. Life sciences companies, especially those on the cusp of expansion, must have enough GMP space to ensure uninterrupted workflow and marketable output. Even since the start of the pandemic, the sharp uptick in GMP space needs has been evident. Demand for

services of contract manufacturers has escalated notably since March alongside concerns over supply chain interruptions; this shows a recognition of the value of quick and effective production expansion (and contraction, should circumstances dictate). Life sciences companies are clearly prioritizing growth potential, and the ability of real estate to secure dependable growth has never been more evident.

Over the past few years, as the asset class becomes more institutional and mainstream, the life sciences construction pipeline has moved to a higher plateau. However, life sciences buildouts are complex and time-consuming, which is a mismatch for fostering innovation. Leasing and adaptive reuse of existing GMP space is a much more effective solution to ensure that companies reap the full benefits of the wave of upcoming innovation. Life sciences investors are still in the process of familiarizing themselves with the GMP subsector, but in time, once its second-generation use potential becomes more evident, GMP properties should emerge from general R&D space with pricing more reflective of its full value.

Adaptive reuse example: Seattle

The status of Seattle as a major life sciences hub is growing quickly, thanks to the depth of its life sciences workforce, its multiple world-class research institutions and cross-pollination from its vibrant tech industry. Lack of available space is the only thing standing in the way of further industry expansion. In the first quarter of 2020, with no new development in the Bothell submarket pipeline, developers began converting former T-Mobile data center space to provide much-needed relief for growing tenants in this highly constrained market.

2.

How do we heighten productivity?

Life sciences facilities are, first and foremost, workplaces. As such, they have had to adapt to pandemic workplace rules in much the same way that more traditional workplaces have, but with the added challenge in many cases of having to ramp up significantly to contribute to anti-COVID pharmaceuticals, making safe and appropriate adaptation indispensable. Life sciences companies adapted by alternating shifts, increasing social distancing on site and allowing employees to work from home to the extent possible. However, remote work potential, at least in the short term, is much more limited for research scientists than for traditional offices, as experimentation largely requires sophisticated on-site equipment. The lab of the future/next-gen lab may well involve a bifurcation of space between research and administrative, with the latter more likely to be remote or at a different location. In some cases, larger space requirements may be indicated to accommodate social distancing (as well as enhance the ability to hire and expand to capitalize on quickly changing industry conditions).

Longer term, the ongoing maturation of artificial intelligence (AI), digital clinical trials, machine learning and computational science should expand the possibilities going forward. For the past several years, as data scientists have become increasingly crucial to the R&D process, total space composition has begun to shift from majority wet lab to a more even combination of wet lab, flex lab and computational science. The top life sciences clusters, both established (Boston, San Francisco and San Diego) and up-and-coming (NYC, Seattle), are also leading tech hubs, which provides a wealth of labor pool options within computational science, increasing overall life sciences productivity. The ongoing ascendance of tech within the national economy supports further overall strength in these markets and lifts their status with respect to investment. An increased share of less-specialized computational space could also open properties to a deeper pool of potential tenants, as well as expand disposition and monetization opportunities.

How can life sciences companies adapt for future pandemics? Themes from within the industry:

In June, representatives from major occupiers took part in a Virtual Client Forum, sharing their adaptation ideas with us. These ideas included:

- **Desk-sharing enabled by rotational staffing**
- **Voice-enabled touchless features**
- **Pop-up meeting pods to minimize commutes (this was a major concern, as many life sciences facilities are in dense urban areas, requiring taking a risk on public transportation use)**
- **Self-screening apps to complete before security badges are activated**



Computational (dry) lab. Source: JLL Research

Additionally, as virtual lab work develops, more corporate resources may be required for investment in remote collaboration and training, which would amplify the demand for real estate that can help achieve cost optimization.

However, even with more advanced long-term technology, life sciences remote work will be more limited than for other office-based industries because of the unique role of real-time, live collaboration within its culture. This type of collaboration is particularly essential to maximizing productivity and speed to market, not to mention securing proprietary information. For this reason, **a shift rather than a reduction of space** (e.g., more leasing for flexibility, more outsourcing of administrative functions) will likely be preferable in the long run.

COVID-19 impact on future life sciences demand

	Health-driven changes	Economic-driven changes	Strategic-driven changes
Key theme	Social distancing	Capital preservation	Workforce deployment
Immediate tactical response	<ul style="list-style-type: none"> Strategic occupancy or space plans, prioritized based on business impact, are becoming essential. 	<ul style="list-style-type: none"> Flexibility is key; waiting to deploy resources 	<ul style="list-style-type: none"> Establishing criteria for projects that can be deferred within a 90- to 120-day window is becoming a best practice
Short-term CRE impact	<p>—</p> <p>Demand picking up as FDA approvals accelerate</p>	<p>=</p> <p>Lab tenants largely operate on long timelines</p>	<p>+/-</p> <p>Reduce space usage in the short term (but compensated by staggered shifts and extended hours for COVID-19 labs)</p>
Long-term CRE impact	<p>+/-</p> <p>Depends on lab activity; ultralow vacancy going into pandemic should help keep fundamentals balanced</p>	<p>+/=</p> <p>Could see an increased emphasis on leasing vs. ownership to facilitate right-sizing as conditions change; this would be a positive for CRE</p>	<p>=</p> <p>The fundamentals of the sector remain robust; investment thesis for life sciences will strengthen in coming years, prompting demand for lab space</p>

Short-term impact on lab demand: neutral.

Long-term impact: positive.

Widespread COVID-19-related supply chain disruptions have also prompted broad-based support for reshoring of manufacturing, which would be a structural change for the industry. While previously manufacturing was located largely overseas for budgetary reasons, life sciences companies now realize that proximity between labs and manufacturing facilities will translate to profitability for any and all effective COVID-19-related pharmaceuticals. The federal government has made this a major priority by authorizing BARDA (Biomedical Advanced Research and Development Authority), the Centers for Disease Control and Prevention, the Food and Drug Administration and the National Institutes of Health to advance domestic vaccine production through the government program “Operation Warp Speed.” This program aims to produce hundreds of millions of vaccine doses through 2021 by funding vaccine-related clinical trials at multiple life sciences companies, including AstraZeneca, Moderna, Pfizer, Johnson & Johnson and Merck. Operation Warp Speed will assume risk above the private threshold by starting manufacturing during the clinical trials phase (but saving distribution until after trials are successfully concluded). The scope and scale of Operation Warp Speed is a significant tailwind for life sciences real estate demand, both directly for manufacturing and GMP space and indirectly by ensuring continuity of production for the new products developed in labs. Overall, Operation Warp Speed should reassure venture capital and private-equity investors, which in turn will enable companies to sign leases confidently.

Virtual clinical trials

In March, the FDA relaxed regulatory guidelines in order to permit larger-scale virtual clinical trials to ensure both safety and continuity within the life sciences community. These regulations are likely to return to some degree post-pandemic, but much like with telehealth, the success of virtual clinical trials will prompt some stickiness. Virtual clinical trials have many advantages apart from pandemic-proofing, including the following:

- Aligning life sciences further with the robust tech industry, which could create more funding opportunities
- High-frequency observations, including real-time side effects
- Inclusion of a wider, location-independent set of test subjects

Sources: Morgan Stanley, Cambridge Cognition

Cutting costs, creating continuity—examples from the field

In May, health care tech company Premier Inc. and 15 of its large health system members purchased a minority stake in Prestige Ameritech, the largest domestic manufacturer of PPE. Members signed a six-year agreement to procure a portion of all face masks they use from Prestige Ameritech for up to six years. This purchase aligns with Premier’s overarching strategy to secure its supply chain by investing in domestic and geographically diverse suppliers of PPE; the contracted expenditure creates economies of scale, offsetting domestic purchase. On the pharma side, last week, the Virginia-based Phlow Corporation obtained a \$354 million, four-year contract from BARDA to manufacture generic drugs and pharmaceutical ingredients for COVID-19 treatment. The contract encompasses collaboration with private-sector, U.S.-based drug and chemical manufacturing companies. The goal is to promote the creation of a reserve of pharmaceuticals to circumvent drug shortages.

Source: Advisory Board

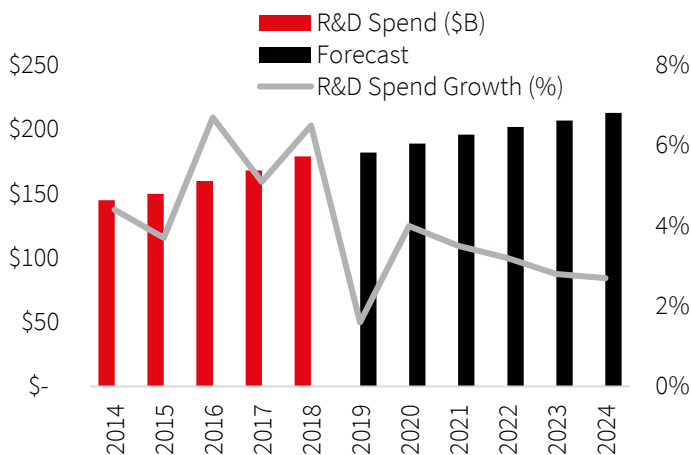


3.

How do we adapt to more acute consumer and patient needs?

The life sciences industry enjoys both cyclical and structural tailwinds with respect to consumer demand. Naturally, any COVID-19-related treatment is highly anticipated. However, because COVID-19 can increase the acuity of many underlying conditions, the pandemic has also accelerated demand for a variety of additional therapeutics. More than half of the life sciences industry's revenue is generated by sales of healthcare products, and prior to the pandemic, demand for pharmaceuticals and medical devices was already accelerating, driven by the increasing medical needs of the aging U.S. population. This demand has long been anticipated, and many years of R&D investment have set the stage for the spate of pharmaceutical development that is beginning to occur as the baby boomers move into retirement.

Global biopharm R&D spend forecast

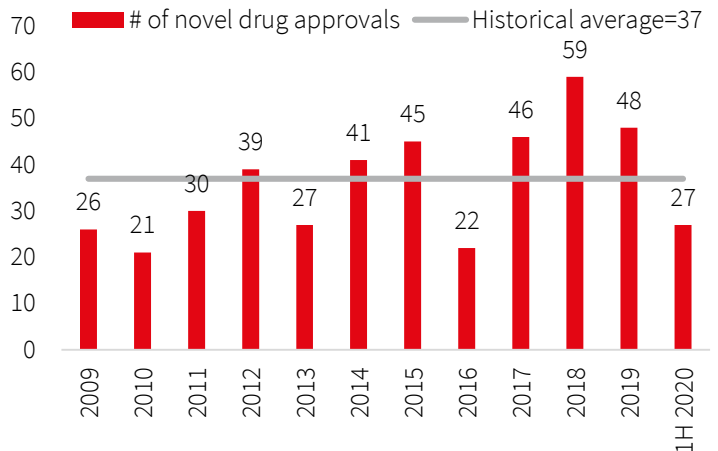


Source: EvaluatePharma

The worldwide prescription drug market is expected to surpass \$1 trillion by 2022. Yet the costs associated with drug development are often prohibitive for all but the most well-funded players. In 2018, the Tufts Center for the Study of Drug Development estimated an average cost of \$2.6 billion to develop and win FDA approval for a novel pharmaceutical. However, the circumstances of the pandemic have pushed the FDA to expedite their approval processes significantly, employing emergency use authorizations not just for COVID-19 but for flu diagnostics as well in anticipation of the first combined COVID-19/flu

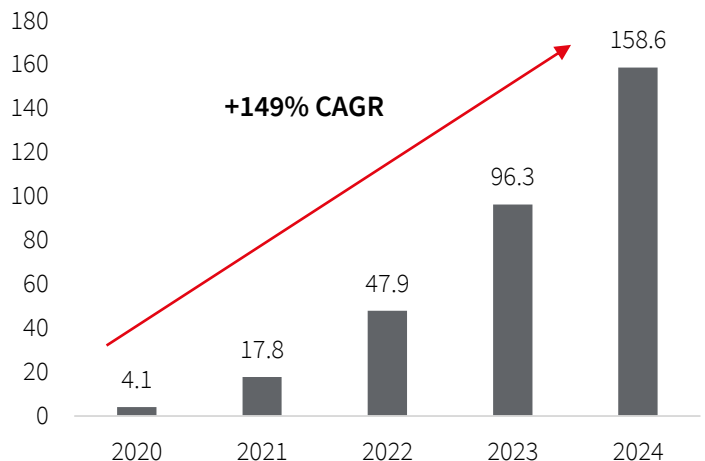
season. Because COVID-19 has raised the level of acuity of any given condition, a faster general approval process is widely expected. The timing is advantageous as well—FDA approvals have been on a hot streak over the past several years, exceeding their 10-year average for three years running, and 2020 is on track to meet or surpass the previous peak in 2018. A new level-set for FDA approvals would vastly improve profitability and production prospects for life sciences companies, in turn amplifying real estate demand.

FDA drug approvals moving to higher long-term level



Source: FDA

Worldwide product pipeline sales (\$B)



Source: EvaluatePharma

Additionally, the race to develop anti-COVID-19 vaccines and therapeutics is promoting multi-institutional cross-partnerships. In one example, Massachusetts Eye and Ear and Massachusetts General recently announced a partnership with Novartis (through its subsidiary AveXis) to develop, mass-produce and distribute a gene-based COVID-19 vaccine in Boston. This partnership contains significant benefits on both the academic and industrial sides, accelerating the production and distribution capacity of research scientists and guaranteeing steady activity for Novartis. The increase in competition and profit potential should spur similar deals, multiplying revenue streams to life sciences companies, circulating best practices and reinforcing the need for productive real estate.

Capital markets profile

Life sciences real estate is now well understood on a secular level by investors, with institutional capital pursuing deals for a full decade. As investment history lengthens, the sector becomes more transparent, extending itself to more capital sources as well as entry and exit strategies. This new level of investor insight comes at a time when research, development and lab activity within the life sciences industry are reaching new heights. This industry momentum provides the perfect backdrop for new construction to satisfy abundant real estate demand, particularly in ascending markets.

Given the primary role life sciences are poised to play in both the economic and immunologic pandemic recovery, life sciences real estate capital markets are well positioned for relative outperformance in 2020. Transactions are occurring at pre-COVID pricing in many of the top clusters as capital markets thaw and investors look to move off the sidelines. The investment thesis is solid and multi-layered:

- Abundant upside as R&D investments ripen, venture capital continues to abound and Operation Warp Speed infuses the industry with a new source of capital.
- Steady stream of government funding from the NIH, which is the primary federal government agency charged with conducting and supporting biomedical and behavioral research. NIH provides grants to support research at university and medical research centers across the U.S. According to the Congressional Research Service, NIH funding has increased from \$11.0 billion in 1994 to \$39.1 billion in 2019.
- Wide range of second-generation opportunities given structurally low vacancy and construction when compared to traditional office.
- Rise of computational science broadens tenant interchangeability, lowering potential TI costs.

Developer spotlight: Hines in Houston

Known for its focus on traditional property types such as office and multifamily, Hines recently showed strong confidence in Houston life sciences by partnering with 2ML Real Estate Interests to develop Levit Green, a 52-acre multi-use master-planned community of office, residential, retail and hospitality with life sciences research facilities as its centerpiece. This project illustrates a new level of recognition of the life sciences industry as an economic and civic magnet and its multiplicative effect on other types of real estate demand. Fueled by secure demand, life sciences real estate should move increasingly out of niche status and closer to a major sector in its own right.

Source: Hines

Current life science dealflow is dominated by healthcare-related companies, as COVID-19 continues to provide cyclical tailwinds to therapeutics producers, directly related both to COVID-19 itself and to underlying conditions that render COVID-19 more dangerous. Recent IPOs are in line with the sector trend to scale up and price at the top of the marketing ranges, and follow-up funding has been similarly strong. Shareholders are responding to the magnification of productivity offered by FDA fast-tracking, potential manufacturing reshoring and other positive sector trends, which will all be positive for life sciences real estate demand.

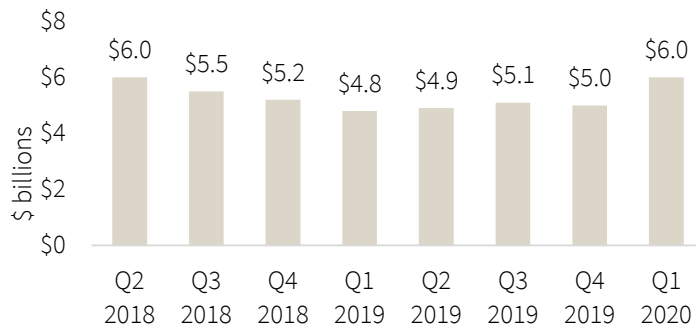
An ocean of liquidity for life sciences

- \$6B in VC life sciences funding Q1 2020
- NASDAQ Biotech Index up 15% 1H 2020 against 4% S&P 500
- 27 life sciences IPOs in 1H 2020 generating \$4.8 billion in proceeds, with an average post-issuance increase of 70%

Sources: PwC, SMBC, JLL Research

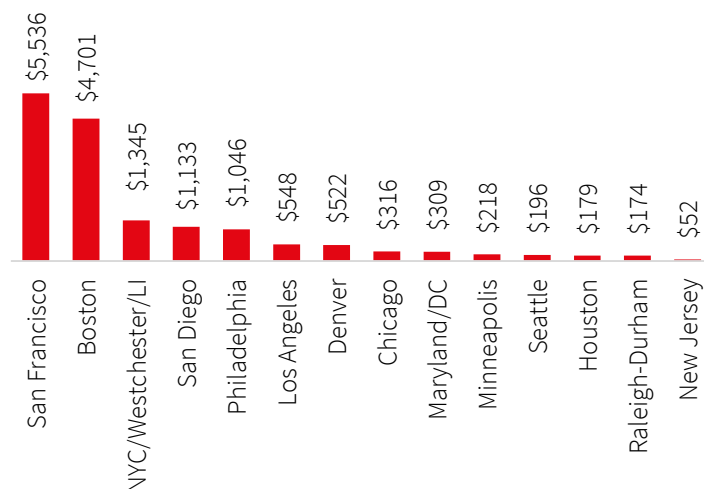
However, many investors won't want to wait for the IPO stage, as over the past few years tech companies in general have tended to go public later in their value cycle. Given the growth thesis, venture capital will want to continue to enter early. The outpouring of venture capital funding into the industry is a major positive for life sciences capital markets; of the 14 markets profiled in this outlook, five (NYC, Philadelphia, Denver, Los Angeles and Houston) set a venture capital (VC) record in 2019, and six (Boston, San Diego, Maryland, Raleigh, Chicago and Minneapolis) recorded their second-highest VC levels. Interestingly, according to PwC MoneyTree, U.S. healthcare has recently experienced a sharp uptick in VC mega-rounds, raising \$2.8 billion in Q1 of 2020, an 88 percent quarter-over-quarter increase and representing 55 percent of the \$6 billion total raised in the quarter. The rise of mega-rounds is a trend to watch. It increases industry stratification and could portend upcoming M&A activity, a positive for life sciences real estate, as it tends to raise tenant credit.

Q1 2020 life sciences VC funding grew 25% YOY, matching previous peak



Source: PwC Healthcare MoneyTree Report Q1 2020.
Includes Biotechnology, Medical Devices, Drug Development and Other Healthcare.

2019 VC funding by cluster (\$ millions)

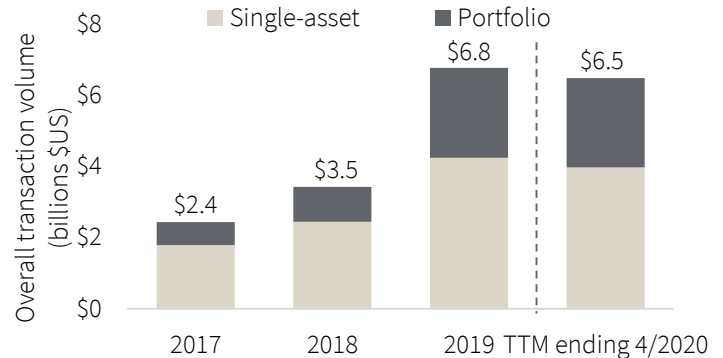


Source: Crunchbase

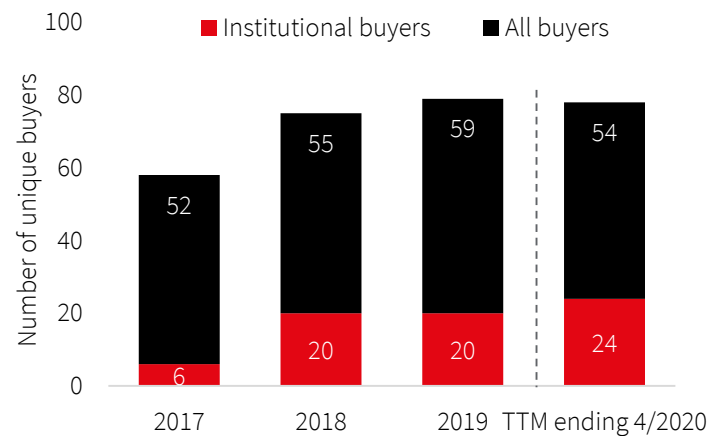
Life sciences real estate investment has matured substantially in the past 10 years. Beginning with highly specialized institutional ownership by dedicated niche REITs, life sciences real estate investment has gained increasing institutional acceptance alongside the growing importance, activity and venture capital attraction of biotechnology. Life sciences real estate investment now includes major strategic, private-equity, institutional, REIT and foreign capital players.

Broadening and institutionalizing buyer pool bolsters transaction volumes for life sciences

Life sciences transaction volume



Active life sciences investors



Sources: JLL Research, Real Capital Analytics (transactions above \$5.0 million)

Looking forward >

Against the backdrop of an extraordinary level of uncertainty, the life sciences industry has emerged as vital, durable and expansionary, offering a degree of upside that is hard to come by in the current environment. Given the intense competition and high stakes for first-to-market pharmaceuticals, for both COVID-19 and a wide variety of other conditions, prioritizing a productive life sciences real estate strategy will determine future leaders in the

industry. The beginning of GMP manufacturing onshoring presents an additional structural lift, securing the supply chain and shortening the path to profitability. Robust long-term fundamentals within the life sciences industry should continue to draw in venture capital, private equity and corporate investors over the coming years, driving growth and demand for life sciences real estate.



Local markets

- 14** Boston
- 18** Chicago
- 20** Denver
- 23** Houston
- 25** Los Angeles–Orange County
- 27** Maryland
- 31** Minneapolis–St. Paul
- 32** New Jersey
- 34** New York
- 38** Philadelphia
- 41** Raleigh–Durham
- 44** San Diego
- 48** San Francisco Bay Area
- 52** Seattle–Bellevue

Boston

Cluster score
89.0

Key insights

19 of the 20 largest biotechnology and pharmaceutical companies have a presence in Greater Boston, making it the number one market for investment and talent.

With over local 50 universities, world-class research hospitals and over \$15 billion of private investment over the last three years, Greater Boston remains the epicenter of life sciences activity in the world.

Cambridge

With nearly 11 million square feet in existing lab inventory, Cambridge and Kendall Square remains the epicenter of global life sciences research. Buoyed by a steady stream of top talent from MIT and Harvard, laboratory space is highly coveted as vacancy rates have been near 0 percent for three years going, with asking rents over \$100 in East Cambridge and \$80 in West Cambridge NNN.

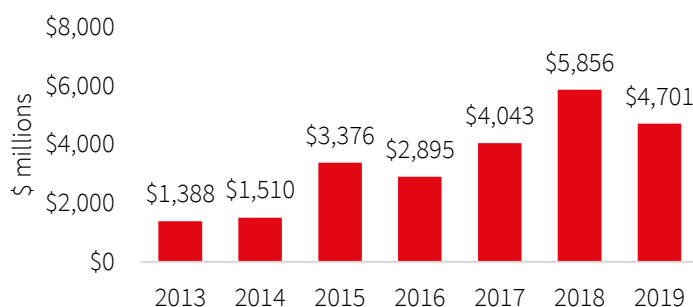
The Seaport

The Seaport has arguably become the hottest life sciences cluster within Greater Boston as 0 percent vacancy in Cambridge has pushed many growing companies to look elsewhere. With 2.1 million square feet of existing lab product, 1.3 million square feet currently under development and another 3 million square feet of proposed pipeline, the Seaport could become the second-largest submarket within 5–10 years.

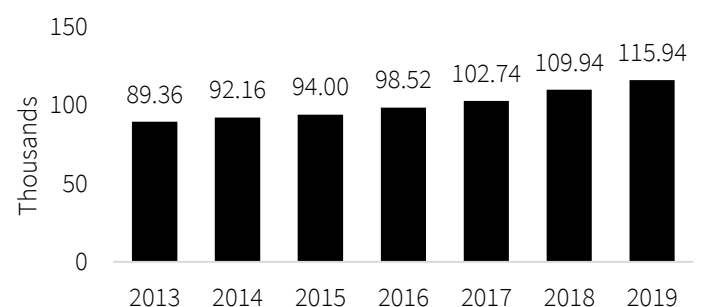
Core Suburbs/Somerville

With most development sites spoken for in Boston and Cambridge, and demand far greater than existing supply, investors have turned to Somerville and the suburbs for lab development. There is over 1.5 million square feet of lab development, including both ground-up and office conversions, as landlords have taken advantage of increasing rents and office vacancies to convert space to lab.

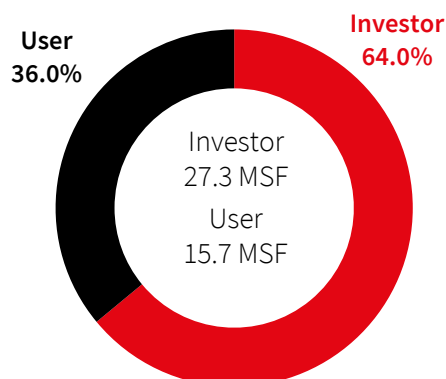
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

Workforce	Total life sciences	% life sciences to private employment	
		Five-year growth	
Employment	115,942	4.4%	23.3%
Establishments	2,842	1.7%	23.0%
Funding	Total life sciences	% to total U.S.	
VC funding	\$4,701M	24.6%	
NIH funding	\$2,810M	9.0%	
Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (NNN)
	27.3M s.f.	6.0%	\$69.31 p.s.f.

Cambridge

East Cambridge

Innovation continues to boom in Kendall Square

- Harvard-born company Moderna continues to pave the way in the race for a COVID-19 vaccine. The local company started in 2010 and has expanded to over 500,000 square feet across the local market.
- MIT's 238 Main Street development was fully leased up throughout 2019 and 2020 to pharma giant Bayer, local company Beam Therapeutics and prominent lab incubator LabCentral.
- Blackstone announced a \$2 billion investment in Cambridge-based Alnylam with a promising RNA treatment for high cholesterol. Alnylam is expected to expand within Kendall Square in a land site controlled by Blackstone and BioMed Realty as it continues to grow rapidly.

West Cambridge

Alewife rents skyrocket as growing companies migrate in from East Cambridge

- West Cambridge rents have doubled since the beginning of 2015, climbing north of \$80 p.s.f. NNN.
- New construction has driven the leasing market in the last 18–24 months with 500,000 square feet of new speculative product hitting the market at 35 CambridgePark Drive and 400/500 Cambridge Discovery Park. Between the two buildings only one floor of 32,000 square feet has yet to be leased. A majority of the tenants that signed leases across these two projects migrated from East Cambridge.

Facilities scorecard

Supply	East Cambridge	West Cambridge
Rentable lab stock	8.9M s.f.	1.3M s.f.
Owner-occupied lab stock	2.1M s.f.	100K s.f.
(% of total lab stock)	32.6%	4.7%
Total vacancy	0.4%	13.5%
(Change year-over-year)	-0.5 ppts	+6.2 ppts
# of large blocks over 50,000 s.f.	1	0
Under construction (s.f.)	1,400,600 s.f.	0 s.f.
Demand		
# of requirements	17	5
Total s.f. requirements	850,000 s.f.	184,000 s.f.
Pricing		
Average asking rent (NNN)	\$102.50 p.s.f.	\$80.31 p.s.f.
(Change year-over-year)	+4.1%	+7.2%

Recent activity

Intellia

281 Albany St.
Cambridge
39,000 s.f.
Expansion

Healthpeak Properties

The Davis Cos/Invesco
35 CambridgePark Drive
Cambridge
223,000 s.f.
\$1,491 p.s.f.

Cambridge Crossing

250 Water St.
Cambridge
504,000 s.f. available
Q1 2022

Moderna

200 Technology Square
Cambridge
47,000 s.f.
Expansion

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

The Seaport

The Seaport

The burgeoning Seaport continues to attract investment and tenants

- The Seaport has matured into a well-established life sciences cluster over the last 18–24 months as investors and tenants continue to flock to the waterfront area.
- There is 1.3 million square feet of lab space under construction, including two build-to-suits. Related Beal is under way developing phase two of Innovation Square for Vertex at 268,000 square feet on the eastern edge of the Seaport, and WS Development has Foundation Medicine signed on for the first of two buildings within the Seaport Labs development.
- Other notable projects include a new development partnership between Tishman Speyer and life sciences investor Bellco Capital called Breakthrough Properties. The partnership broke ground on Parkside on A in the second quarter of 2020 with a 250,000-square-foot speculative development at the bottom of the A Street corridor of the Seaport. Expected completion is the end of 2021 and asking rents start in the low to mid-\$80s NNN.
- In the future development pipeline, there is an additional 3.5 million square feet of developments poised to deliver sometime after 2024 that are still in the planning and entitlement phases.
- Additionally, local Seaport tenant Akouos, which is working on a gene therapy for hearing disorders, tapped into the public markets at the end of June, raising \$212 million. The biotech firm’s value leaped nearly 30 percent on the first day of trading.

Facilities scorecard	
Supply	The Seaport
Rentable lab stock	2.1M s.f.
Owner-occupied lab stock	0M s.f.
(% of total lab stock)	7.7%
Total vacancy	10.8%
(Change year-over-year)	-1.1 ppts
# of large blocks over 50,000 s.f.	2
Under construction (s.f.)	1,294,000 s.f.
Demand	
# of requirements	8
Total s.f. requirements	520,000 s.f.
Pricing	
Average asking rent (NNN)	\$80.34 p.s.f.
(Change year-over-year)	+8.2%

Recent activity	
Vertex ISQ Phase II Boston 268,000 s.f. Expansion	Beacon Capital/CalSTRS Related Beal 27 Drydock Boston 289,000 s.f. \$932 p.s.f.
Parkside on A 105 W. First St. Boston 250,000 s.f. available Q4 2021	Foundation Medicine 400 Summer St. Boston 585,000 s.f. Expansion
Activity key: Leasing Sales Under construction Large blocks of space	

Core Suburbs/Somerville

Core Suburbs

Vacancy halves as the suburbs continue to expand rapidly

- Vacancy has halved in the last 18 months in the Core Suburbs to the lowest level ever, as demand has emanated out of East Cambridge and from growing companies within the market.
- New investors have capitalized on this demand; Phase 3 Real Estate, Hobbs Brook and IQHQ all purchased their first existing lab product in Billerica, Lexington and Andover respectively. Phase 3 also purchased vacant office building 1560 Trapelo from the Bulfinch Companies and is in the process of converting the space to lab. Hobbs Brook, a subsidiary of insurance giant FM Global, completed its acquisition of the well-established 187,000-square-foot Ledgemont Technology campus in Lexington from Related Beal. IQHQ purchased the vacant 200,000-square-foot Eisai campus, signing two small deals in the first quarter of 2020.

Somerville

Somerville emerges as next hot lab cluster

- While there has yet to be a true lab deal done in Somerville, the buzz about the city is certainly alive and real. DLJ Capital broke ground on Phase I of the 800,000-square-foot Boynton Yards campus. The building is expected to deliver in the end of 2021.
- In Union Square, USQ is readying to break ground on Phase I of the 2.4 million-square-foot mixed-use development, which will kick off with a 190,000-square-foot speculative lab building delivering in the second half of 2022.
- Finally in Assembly Row, BioMed Realty successfully received approval from the city to begin work on the 1.6 million-square-foot campus called Xmbly starting late this year.
- While there may be no existing product in Somerville, and only one building under construction, the future pipeline is robust, totaling over 4.4 million square feet. Its proximity to Kendall Square, future access to the Green Line and boundless restaurants and bars create a truly unique live/work/play environment other submarkets cannot offer.

Facilities scorecard

Supply	Core Suburbs	Somerville
Rentable lab stock	4.8M s.f.	0M s.f.
Owner-occupied lab stock	2.1M s.f.	0M s.f.
(% of total lab stock)	17.6%	0.0%
Total vacancy	6.6%	0.0%
(Change year-over-year)	-3.5 ppts	N/A
# of large blocks over 50,000 s.f.	1	0
Under construction (s.f.)	1,102,731 s.f.	290,000 s.f.
Demand		
# of requirements	17	3
Total s.f. requirements	875,000 s.f.	100,000 s.f.
Pricing		
Average asking rent (NNN)	\$60.18 p.s.f.	\$77.50 p.s.f.
(Change year-over-year)	+9.2%	N/A

Recent activity

Arrakis Therapeutics

828 Winter St.
Waltham
67,702 s.f.
Expansion

Healthpeak Properties

Anchorline/Northwood
200 Smith St.
Waltham
430,000 s.f.
\$744 p.s.f.

225 Wyman

Waltham
500,000 s.f. available
Q1 2022

Dicerna Pharmaceuticals

75 Hayden Ave.
Lexington
61,282 s.f.
Expansion

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Chicago

Cluster score
24.0

Key insights

Chicago realized its fourth consecutive year of being ranked in Genetic Engineering and Biotechnology News' list of Top 10 U.S. Biopharma Clusters moving one spot ahead of last year.

Illinois saw its NIH funding grow 33% compared to last year, the majority is the result of world renowned institute Northwestern University.

Chicago Metro

Chicago is home to some of the most world renowned life science companies. Dominating the industry are publicly traded companies Abbott, Baxter, Pfizer, Horizon, Astellas, and Abbvie, while continued investment through government agencies has supported local institutions Fermilab and Argonne National Laboratories. Venture capital funding continues to grow recently with the last three years combining for 44% of the funding of the last decade. The metro is also the second largest concentration of pharmaceutical manufacturing employment in the nation.

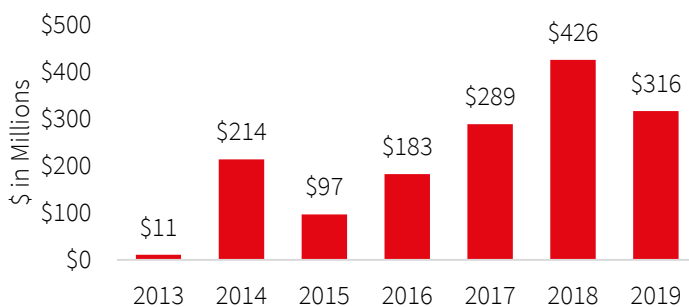
Northshore

Chicago's north shore, especially Lake County continues to thrive as a biotechnology/pharmaceutical hub housing over 100 life science companies with multiple headquarters including the largest, Abbott. Employees at biopharmaceutical firms earn nearly 50 percent more than the overall average wage in Lake County. The north shore is also home to almost five million SF of space occupied by Life Sciences users, including the 24 acre Illinois Science & Technology Park.

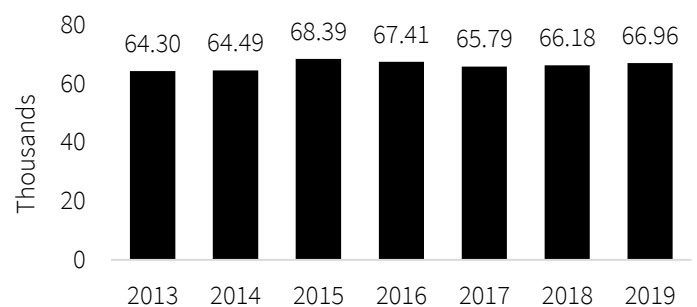
Chicago

Chicago houses a number of globally recognized biomedical universities including the University of Chicago, UIC, and Northwestern University Feinberg School of Medicine. The latter attracts over \$700M in federal funding each year and has the fastest growing NIH funding in biomedical research with an additional \$1.5 billion expected over the next 10 years. The demand for lab space has triggered almost 700,000 square feet of mixed lab/office space within proximity to downtown to be developed over the next few years.

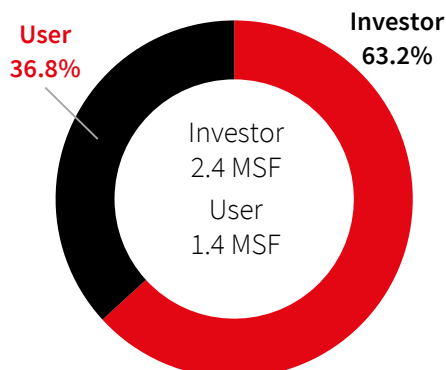
VC funding



Life Science Jobs



Ownership share



Economic indicators overview

Workforce	Total life sciences	% life sciences to private employment	
			Five-year growth
Employment	66,962	1.5%	-2.1%
Establishments	1,661	0.7%	-8.4%
Funding	Total life sciences	% to total U.S.	
VC funding	\$316M	1.7%	
NIH funding	\$906M	2.9%	
Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	3.4M s.f.	5.9%	\$26.43 p.s.f.

CBD/North Shore

Chicago CBD

Continued innovation is the key to Chicago's life sciences growth

- Northwestern University in Downtown Chicago recently opened the largest biomedical academic research facility in the nation at 625,000 square feet.
- Trammel Crow plans to address the shortage of high-quality local lab space by building a 400,000 square foot life sciences laboratory and office building in the trendy Fulton Market.
- The city broke ground on a 500,000 SF University of Illinois affiliated research facility that expects to invest \$200M annually into R&D through public and private sector funding.
- Sterling Bay has quickly leased 51% of a 120,000 SF lab building they acquired in 2019. They have slated additional lab buildings within their Lincoln Yards development to serve as space that new users, and users within their current lab building can grow into.

North Shore

Big pharma and biotechnology continue to thrive

- Abbvie agreed to keep its HQ in the Northern Suburbs after its \$63B acquisition of Wisconsin based Allergan.
- Soon after receiving FDA approval for the use of teprotumumab, Horizon Therapeutics purchased the recently vacated three building Takeda Pharmaceutical campus in Deerfield. The company also added 200 local jobs in 2019.
- AveXis, acquired by Novartis in 2018 for \$8B, continues to grow and cement its presence in Lake County by leasing 118,000 square feet of office/industrial space at Innovation Park in Libertyville. The technology park also houses the growing life science company, Valent Biosciences.

Facilities scorecard

Supply Chicago Metro

Rentable lab stock	2.4M s.f.
Owner-occupied lab stock	1.4M s.f.
(% of total lab stock)	36.8%

Total vacancy	5.9%
(Change year-over-year)	+2.5 pts

# of large blocks over 50,000 s.f.	6
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Under construction (s.f.)	680,000 s.f.
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Pricing

Average asking rent (NNN)	\$26.43 p.s.f.
(Change year-over-year)	+2.9%

Recent activity

Avexis

1910-1950 Innovation Way
Libertyville
118,000 s.f.
New & Expansion

Horizon Therapeutics

Takeda Pharmaceutical
1 Takeda Parkway
Deerfield
777,345 s.f.
\$148 PSF

Fulton Labs

400 N Aberdeen
Chicago
423,454 s.f.
2022

University of Illinois

Discovery Partners
The 78
Chicago
500,000 s.f.
2024

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Denver

Cluster score
28.8

Key insights

With 46.5 percent of its population holding a bachelor's degree or higher, Denver benefits from one of the nation's most highly educated labor forces. A consistent, above-average flow of in-migration has offered businesses a wealth of talent.

Access to numerous higher education and research facilities, which boast ample bioscience infrastructure, allows the Denver metro to act as an incubator for various life sciences start-up companies.

Denver

Users and real estate professionals alike often compare the search for appropriate lab space in Denver to finding a needle in a haystack. Existing infrastructure in lab buildings is extremely scarce, so life sciences companies will often use second-generation restaurant space or clean tech space or shell out the cash to build the space out themselves. Often, smaller users must opt to share lab space. Incubators and start-ups tend to thrive here, but lack of space often pushes these companies to either consolidate or move out once established.

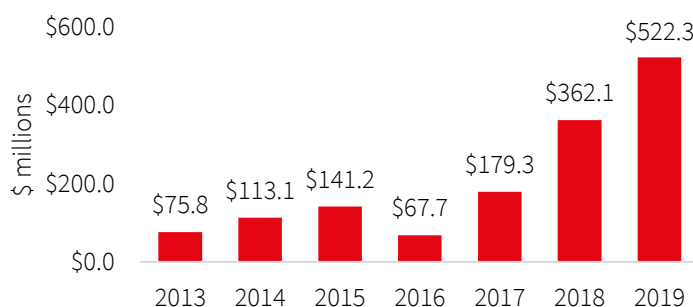
Boulder/Northwest

The Boulder and Northwest submarket cluster comprises 67 percent of Denver Metro's inventory for lab space and is considered among the top two life sciences clusters in the entire region. Product in this cluster is composed primarily of second-generation lab space and flex/office-to-lab conversion space. Most tenant requirements in this area are small, falling in the 5,000- to 15,000-square-foot range. In Boulder County alone, the concentration of biotech employment is four times greater than the national average.

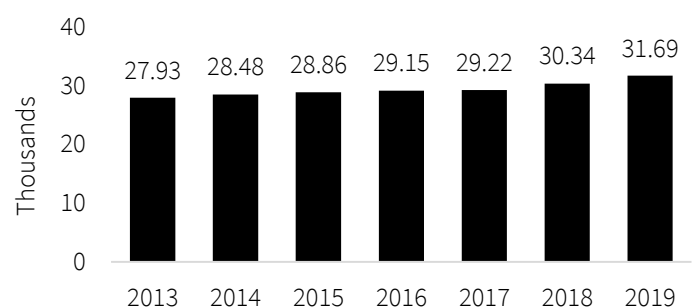
SE/Southeast Suburban

The Southeast and Southeast Suburban submarkets are home to 13 percent of Denver's lab space. Although these submarkets are not the most active within the life sciences sector, the area is home to the Fitzsimons Life Science District and Anschutz Medical Campus—considered the epicenter of Colorado's growing bioscience community. Here, many start-ups benefit from shared creative and incubator space while in growth mode.

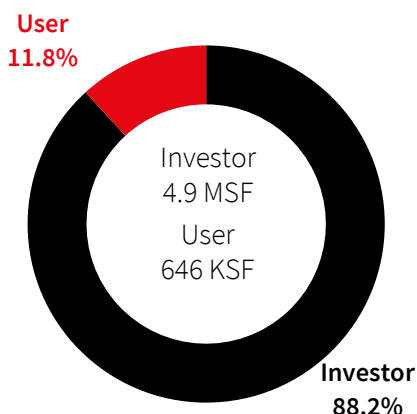
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

Workforce	Total life sciences	% life sciences to private employment	
			Five-year growth
Employment	31,687	1.9%	9.8%
Establishments	1,294	1.1%	8.6%
Funding	Total life sciences	% to total U.S.	
VC funding	\$522.3M	2.7%	
NIH funding	\$426.1M	1.4%	
Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (NNN)
	4.9M s.f.	15.7%	\$16.80 p.s.f.

Boulder/Northwest

Boulder/Northwest

Life sciences companies continue to congregate here

- The Boulder/Northwest submarket cluster encompasses the cities of Broomfield, Boulder, Lafayette, Louisville, Westminster and Longmont and is home to the University of Colorado at Boulder.
- Boulder/Northwest remains the epicenter of life sciences activity in the Denver area.
- Through 2019, Boulder and Broomfield Counties combined to represent the largest share of medical device and diagnostics (engineering, researching, designing and manufacturing) employment in the nine-county region, accounting for one in three jobs for this subsector.
- Longmont and Gunbarrel are low-cost alternatives with access to the Boulder workforce. Longmont has a supply of flex and light industrial buildings that have in-place infrastructure to convert to lab space.
- Given the current global pandemic, companies such as Pfizer (R&D facility located in Boulder) are racing to develop a vaccine for COVID-19. Biodesix has shifted to full-time testing for COVID-19. Still, no life sciences companies are expanding in response to the virus.
- AveXis, a subsidiary of Novartis, closed on the 700,000-square-foot former AstraZeneca campus in April 2019 for \$30 million.
- AstraZeneca's 175,000-square-foot Boulder manufacturing facility is under contract to a Japanese contract development and manufacturing organization.
- Medtronic is selling its existing buildings and continues to engage with the City of Louisville to move its campus to the former Phillips 66 site to develop up to 400,000 square feet of lab, R&D and office space.
- The cluster's largest available block—The Max's 461,330-square-foot space—is of interest to several users.
- Though rental rates have climbed in the cluster over the past year, vacancy has also climbed, indicating a shift away from the market's long-sustained landlord-favorable conditions.

Facilities scorecard

Supply	Boulder	Northwest
Rentable lab stock	1.7M s.f.	1.5M s.f.
Owner-occupied lab stock	831.7K s.f.	57.9K s.f.
(% of total lab stock)	41.9%	25.0%
Total vacancy	22.8%	10.9%
(Change year-over-year)	+2.3 ppts	+4.6 ppts
# of large blocks over 50,000 s.f.	1	0
Under construction (s.f.)	0 s.f.	0 s.f.
Demand		
# of requirements	1	1
Total s.f. requirements	175,000 s.f.	10,000 s.f.
Pricing		
Average asking rent (NNN)	\$15.95 p.s.f.	\$14.79 p.s.f.
(Change year-over-year)	+7.9%	+7.6%

Recent activity

The Max

2452 Clover Basin Drive
Longmont
461,330 s.f.
Class B

Flatiron Park

5777 Central Ave.
Boulder
59,836 s.f. / \$16.25M
Class B

ArcherDX

2425–2555 55th St.
Boulder
54,934 s.f. renewal
Class B

ArcherDX

333–335 Centennial Parkway
Louisville
52,400 s.f. new lease
Class B

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

SE/Southeast Suburban

SE/Southeast Suburban

Fitzsimons anchors the life sciences cluster

- Located in the southeastern quadrant of Denver metro, it boasts the Fitzsimons Life Science District and Anschutz Medical Center, both with lab-ready space.
- Together, these two areas make up one of the largest bioscience developments in the entire U.S. Upon completion, the campus will boast among the nation's most preeminent and concentrated collaboration of patient care and research-learning centers.
- The submarket is home to the University of Colorado Hospital, the University of Colorado Denver's Health Science Schools and Children's Hospital.
- Already more than 16,000 people work within the district; plans estimate a total workforce that will measure in excess of 45,000 and include professions in teaching, patient care and biotech research and development.
- Typical users include start-ups occupying shared, creative and incubator space throughout their growth-mode phase.
- Bioscience 3 opened in December 2019. Its 117,000 square feet features lab, office, warehouse and manufacturing space spread throughout the \$55 million development. The property has largely been targeted by growth-stage companies until now.
- Bioscience 5 is under construction with a 93,834-square-foot flex/manufacturing building, ready for occupancy near year's end. Still, additional buildings are proposed with up to 70 acres available for life sciences development.
- The district will continue to put Denver on the map of U.S. top markets for life sciences in the years ahead.

Facilities scorecard

Supply	SE	Southeast Suburban
Rentable lab stock	472.6K s.f.	411.2K s.f.
Owner-occupied lab stock	0 s.f.	19.9K s.f.
(% of total lab stock)	6.2%	7.2%
Total vacancy	12.3%	26.0%
(Change year-over-year)	+9.9 ppts	+7.5 ppts
# of large blocks over 50,000 s.f.	1	1
Under construction (s.f.)	93,834 s.f.	0 s.f.
Demand		
# of requirements	XX	X
Total s.f. requirements	X,XXX,XXX s.f.	XXX,XXX s.f.
Pricing		
Average asking rent (NNN)	\$22.10 p.s.f.	\$11.25 p.s.f.
(Change year-over-year)	+0.5%	+6.5%

Recent activity

Lincoln Executive Center

6446 S. Kenton St.
Centennial
54,233 s.f.
Class B

Bioscience 5

Peoria St. & E. 23rd Ave.
Aurora
93,834 s.f.
Class A

400 Inverness

400 Inverness Parkway
Englewood
112,198 s.f. / \$15.7M
Class A

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Houston

Cluster score
29.1

Key insights

Amid a global crisis, Houston's life sciences market accelerates with over 2 million square feet focused on three mixed-use projects, each dedicated to next-level facilities in collaboration with the TMC and top universities.

Partnerships between academic institutions and corporations broaden the scope for life sciences, notably Texas A&M's Innovation Plaza and Rice Management Company's The Ion.

TMC³

For decades Houston has been known for its world-renowned medical complex—the Texas Medical Center, located in the heart of Houston. This year, the TMC will prepare to launch its 37-acre project, surrounding a DNA double-helix-shaped green space—TMC³ is designed for the advancement of research, technology and collaborative translation. Anticipated groundbreaking on the campus is set to take place in 2020, infusing 1.5 million square feet of unparalleled research space to the TMC's inventory upon delivery.

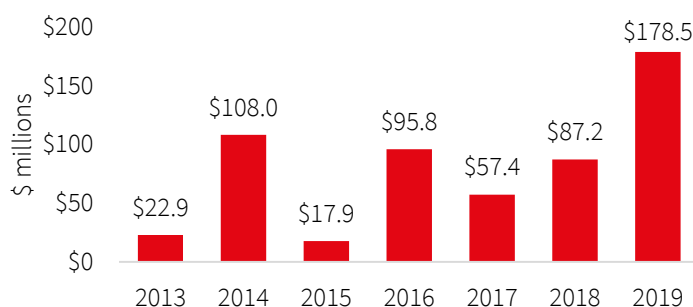
Texas A&M Innovation Plaza

Comprising three buildings in the TMC, Texas A&M's Innovation Plaza will deliver as a state-of-the-art, mixed-use development, bringing the brightest minds in the life sciences industry to one collaborative location. The \$551 million project includes the renovation of 18-story, 1020 Holcombe Blvd., which will be adjacent to the new construction of two neighboring towers. Anticipated to open later this year, the EnMed building will be dedicated to the university's fully integrated engineering medicine dual degree.

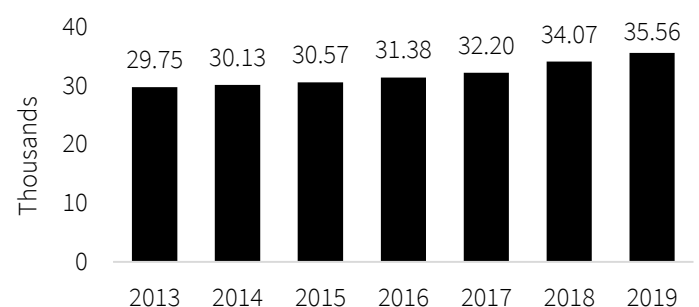
The Ion

Currently under way along Houston's METRORail is The Ion—a 270,000-square-foot innovation campus, connecting academic institutions, entrepreneurs and corporations alike. The Ion moniker will position the city to achieve tighter cluster growth by fostering late-stage clinical trials to attract medical device start-ups. Laying the groundwork in 2019, \$120 million in VC funding was awarded to Rice University affiliate AlloVir, helping kick off the groundwork for The Ion, which will serve as the epicenter of the Houston Innovation District.

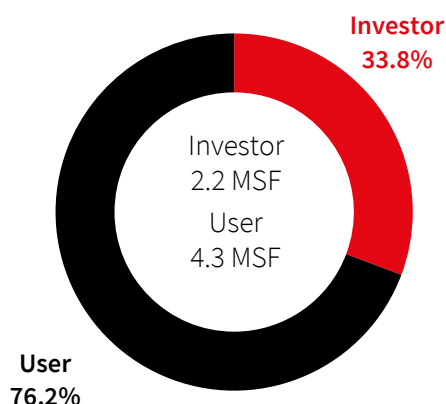
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

		% life sciences to private employment	
Workforce	Total life sciences		Five-year growth
Employment	35,559	1.2%	16.3%
Establishments	1,495	X.X%	9.6%
		% to total U.S.	
Funding	Total life sciences		
VC funding	\$178.5M	0.9%	
NIH funding	\$806.9M	2.6%	
Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (NNN)
	2.2M s.f.	6.3%	\$26.50 p.s.f.

TMC/Near Southwest

Texas Medical Center

More than one-half-million square feet under construction

- Following 2019 as the year for preparation, 2020 will be marked as the launch year of remarkable growth within Houston's life sciences market; The Ion and Texas A&M's EnMed building are officially under way.
- Houston is set in motion to revolutionize medicine through life sciences with three major developments on the map, each fostering R&D, innovative technologies and collaborative translation.
- Delivery of TMC³, The Ion and Texas A&M's Innovation Plaza will boost life sciences space by 1.3+ million square feet, further diversifying Houston and positioning it as a world leader in human health and life science.

Near Southwest

Activity stabilizes in secondary life sciences market

- Secondary life sciences market Near Southwest is located just outside of the TMC. The smaller lab stock cluster is composed of office, flex and manufacturing space, totaling 618,000 square feet.
- Overall market activity in Near Southwest has stabilized since the completion of single-tenant facilities for Merit Medical and Lonza Therapy, which added 372,300 square feet of inventory to the submarket.
- Despite a significant increase in average asking rents, Near Southwest saw recent lease activity to an undisclosed tenant at 2575 West Bellfort Ave. for 10,885 square feet.

Facilities scorecard

Supply	TMC	Near Southwest
Rentable lab stock	1.5M s.f.	618,000 s.f.
Owner-occupied lab stock	3.5M s.f.	0 s.f.
(% of total lab stock)	89.0%	11.0%
Total vacancy	7.6%	9.1%
(Change year-over-year)	+3.1 pts	-2.1 pts
# of large blocks over 50,000 s.f.	0	0
Under construction (s.f.)	595,000 s.f.	0 s.f.
Demand		
# of requirements	4	0
Total s.f. requirements	50,000 s.f.	0 s.f.
Pricing		
Average asking rent (NNN)	\$25.20 p.s.f.	\$23.50 p.s.f.
(Change year-over-year)	+4.1%	+19.9%

Recent activity

Neurogene

10301 Stella Link Road
Houston
26,905 s.f.
New Lease

Undisclosed

2575 West Bellfort Ave.
Houston
10,885 s.f.
New Lease

The Ion

4201 Main St.
Houston
300,000 s.f.
Early 2021

Texas A&M EnMed

1020 Holcombe Blvd.
Houston
295,000 s.f.
Q4 2020

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Los Angeles–Orange County

Cluster score
42.5

Key insights

Los Angeles will continue to grow as an important life sciences cluster fueled by a solid research foundation, large talent pool and a diverse ecosystem.

Highly educated workforce, innovation hubs and collaboration with the healthcare industry have made life sciences a key component of Orange County's economy.

Los Angeles

Los Angeles maintains a robust life sciences ecosystem underpinned by a number of academic institutions such as CalTech, UCLA and USC, which support innovation and sustain a deep pool of talent. UCLA topped off NIH funding with \$452 million followed by University of Southern California with \$282 million and CalTech with \$74 million.

Many new advances and discoveries are also emerging from private medical research hospitals like City of Hope, Cedars-Sinai Hospital and Huntington

Medical Research Institute, to name a few.

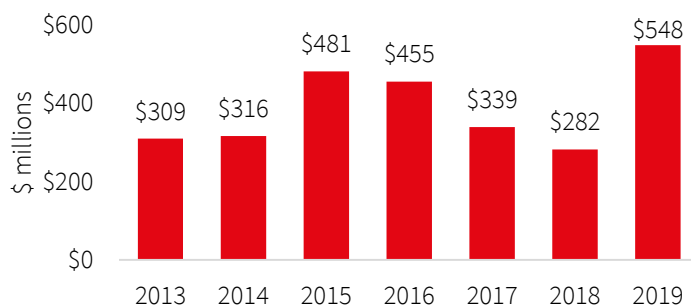
The region is also home to leading biopharma companies including Amgen, Kite Pharmaceuticals, Grifols, Quest Diagnostics and NantWorks.

Orange County

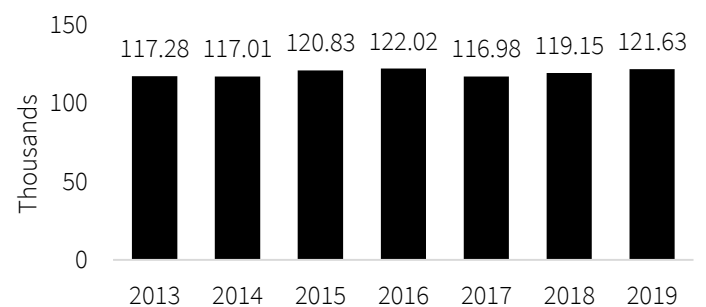
There is a substantial presence of life sciences companies throughout Orange County, with the highest concentration found in the Airport Area and South County submarkets. Larger companies in the market include Allergan, Applied

Medical Resources, Edwards Lifesciences, Johnson & Johnson and Medtronic. The local life sciences industry is diverse, constituting a wide spectrum of sub-sectors with medical device as the largest. Life sciences firms work collaboratively with large medical research institutions to form a comprehensive ecosystem.

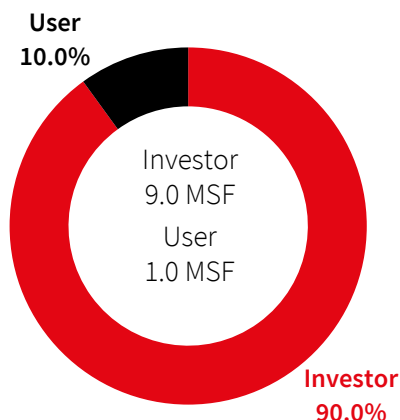
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

Workforce	Total life sciences	% life sciences to private employment	
		Five-year growth	
Employment	121,626	2.0%	0.7%
Establishments	3,570	0.6%	16.7%

Funding	Total life sciences	% to total U.S.	
VC funding	\$548M	2.8%	
NIH funding	\$1,368M	4.4%	

Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (NNN)
	9.0M s.f.	5.0%	\$16.84 p.s.f.

LA/OC

Los Angeles

Pandemic spurs local research

- Dr. Soon-Shiong, founder of NantWorks, acquired Saint Vincent Medical Center out of bankruptcy and will establish a coronavirus research facility on the premise.
- Los Angeles-based NantKwest and ImmunityBio, also started by Dr. Soon-Shiong, are working on immunotherapy treatments and a vaccine to fight COVID-19. Clinical trials are expected shortly.
- Beverly Hills Capricor Therapeutics announced promising test results for a drug to treat COVID-19 patients.
- A \$215 million expansion of Downtown Los Angeles's California Hospital Medical Center is under way and will be ready for occupancy in 2020.
- Life sciences real estate investment company Alexandria Real Estate Equities has finished work on its new five-story, 82,000-square-foot headquarters building in Pasadena.

Orange County

COVID-19 calls for a ramp up of medical device production

- The COVID-19 outbreak has caused life sciences firms to increase device production, along with research and development efforts. Medical device companies including Advanced Sterilization Products, Fluxergy and Vyaire Medical have witnessed a rise in product demand.
- Much of the life sciences industry has pivoted its operational focus to COVID-19 research testing. Research and treatment for other medical procedures have slowed down.
- With a 6.7 million-square-foot lab market, vacancy remains tight at 5.1 percent, with an even tighter market for spaces 50,000 square feet and larger. Demand for life sciences advancement is also evident through recent VC funding rounds, including Laboratory for Advanced Medicine (\$86M), Sonendo (\$85M) and Tarsus Pharmaceuticals (\$60M).

Facilities scorecard

Supply	Los Angeles	Orange County
Rentable lab stock	4.7M s.f.	4.3M s.f.
Owner-occupied lab stock	0.5M s.f.	2.4M s.f.
(% of total lab stock)	10.0%	43.9%
Total vacancy	4.6%	5.1%
(Change year-over-year)	+90 ppts	+1.5 ppts
# of large blocks over 50,000 s.f.	1	2
Under construction (s.f.)	289,439 s.f.	1,047,562 s.f.
Demand		
# of requirements	11	10
Total s.f. requirements	174,405 s.f.	200,000 s.f.
Pricing		
Average asking rent (NNN)	\$16.32 p.s.f.	\$17.40 p.s.f.
(Change year-over-year)	-5.6%	-6.5%

Recent activity

Kite Pharma

2701 Olympic Blvd.
Santa Monica
87,822 s.f.
New lease

NantWorks

BLT Enterprises
2200 East Grand Ave.
El Segundo
30,810 s.f.
\$617 p.s.f.

Robinson Pharma

2701 S. Harbor Blvd.
Santa Ana
102,500 s.f.
New lease

Kingdomway

2742 Dow Ave.
Tustin
51,588 s.f.
New lease

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Maryland

Cluster score
52.2

Key insights

Several life sciences firms have pivoted to COVID-19 therapeutics and vaccines, yielding record-high funding and public-private partnerships through Operation Warp Speed.

Strong tenant demand and low vacancy rates are driving a new wave of life sciences construction and office-to-lab conversions along the I-270 Corridor.

Suburban Maryland

With a vacancy rate just over 7 percent and few large blocks available in the Biohealth Capital Region, a wave of new construction is positioned to meet future demand. Awaiting tenant build-outs are two build-to-suit developments from Alexandria Real Estate Equities totaling 262,000 s.f., as well as an office-to-lab conversion of a previously underperforming asset.

Several proposed build-to-suit developments along the I-270 Corridor are awaiting preleasing and will keep the construction pipeline active in the near future. Frederick County remains a price-conscious alternative to the I-270 Corridor

and presents additional development opportunities for R&D and GMP space uses.

Since Q1 2019, life sciences tenants have driven 870,000 s.f. of leasing demand, nearly a quarter of all activity in Suburban Maryland. Rents are approaching new highs, especially for new construction, with asking rents among prime assets approaching the \$40 p.s.f. NNN threshold for the first time in the market's history.

Several Suburban Maryland firms are actively involved in the production of COVID-19 vaccines and therapeutics, producing industry-record funding and billion-dollar partnerships. Two of the three largest

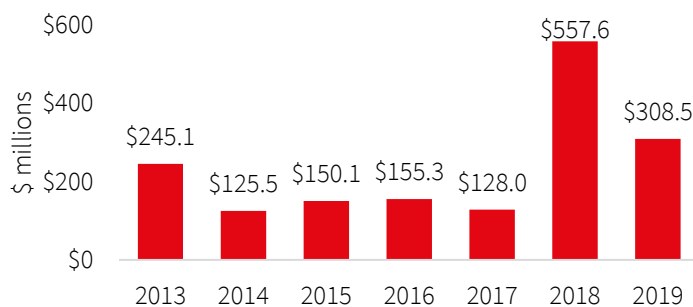
contracts awarded through the federal government's Operation Warp Speed are a result of Maryland efforts to combat COVID-19, totaling greater than \$2.2 billion in contracts awarded.

Baltimore

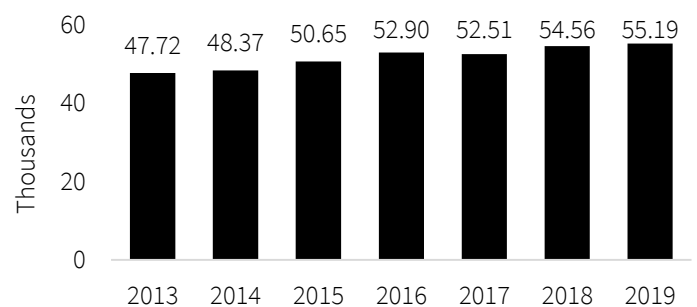
The Baltimore lab market is dominated by institutional campus-oriented projects, with UMB, Johns Hopkins and UMBC representing 3.8 million s.f. of the total 5.9 million s.f. of lab supply in the region.

Despite no recent lab deliveries, a 300,000-s.f. asset at the UMB Biopark will likely be the next project to break ground, while two more parcels are site-plan approved.

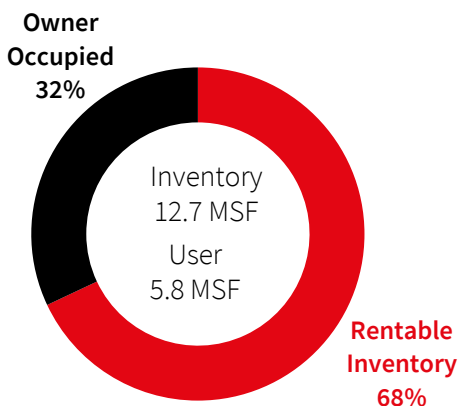
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

Workforce	Total life sciences	% life sciences to private employment	
		Five-year growth	
Employment	55,188	2.0%	9.0%
Establishments	1,963	1.2%	5.9%
Funding	Total life sciences	% to total U.S.	
VC funding	\$308.5M	1.61%	
NIH funding	\$1,886M	6.1%	
Inventory (Rentable)	Total supply	% total vacancy	Average asking rent (NNN)
	12.7M s.f.	8.05%	\$28.85

Suburban Maryland

Shady Grove

The epicenter of the market

- Since Q1 2019, total leasing activity in Shady Grove has accounted for 70 percent of the life sciences market activity. 37 percent of Suburban Maryland's rentable lab inventory is located in the Shady Grove submarket.
- Canada-based Aurinia Pharmaceuticals signed at 77 Upper Rock for 30,500 s.f. in March 2020 to house its American headquarters. Aurinia may employ up to 500 and grow to 120,000 s.f. as it establishes its operations.
- Demand for space is near an all-time high, spurring new construction and office-to-lab conversions. Build-to-suit projects for Regengbio and Autolus totaling over 262,000 s.f. are currently awaiting tenant build-out.
- Alexandria Real Estate Equities, the owner of 30 percent of lab assets in the market, acquired the 115,000-s.f. 9605 Medical Center Drive from Equus Capital Partners in March 2020.

Gaithersburg

Tenants play key role in COVID-19 efforts

- Gaithersburg-based biotechnology firms Novavax and Emergent Biosolutions are at the forefront of the fight against COVID-19. Novavax is set to commence clinical trials for a COVID-19 vaccine candidate and just received \$1.6 billion in funding from Operation Warp Speed to bolster its manufacturing arsenal and expedite vaccine development. Earlier this year, Novavax also received \$388 million in grant funding from the Coalition for Epidemic Preparedness Innovations (CEPI).
- Emergent Biosolutions has signed several manufacturing agreements with companies such as pharmaceutical giant Johnson & Johnson and San Francisco-based Vaxart, and recently joined Operation Warp Speed, agreeing to a contract worth \$628 million with BARDA.
- Rock Creek Property Group's 120,000-s.f. office-to-lab conversion at 700 Quince Orchard is awaiting a tenant commitment.

Facilities scorecard

Supply	Shady Grove	Gaithersburg
Rentable lab stock	3.9M s.f.	2.4M s.f.
Owner-occupied lab stock	80,000 s.f.	1.3M s.f.
(% of total lab stock)	21.3%	19.9%
Total vacancy	5.5%	11.3%
# of large blocks over 50,000 s.f.	1	1
Under construction (s.f.)	262,000 s.f.	122,000 s.f.
Demand		
# of requirements (<i>market-wide</i>)		15
Total s.f. requirements		1.3M s.f.
Pricing		
Average asking rent NNN (Change year-over-year)	\$34.47 p.s.f.	\$28.76 p.s.f.

Recent activity

Aurinia Pharmaceuticals

77 Upper Rock
Shady Grove
30,500 s.f.
New to Market

Alexandria Real Estate Equities

Equus Capital Partners
9605 Medical Center Drive
Shady Grove
115,000 s.f.
\$257 p.s.f.

Building F

9800 Medical Center Drive
Shady Grove
175,840 s.f.
2020

Alexandria Real Estate Equities

BioMed Realty
Darnestown Road
Gaithersburg
18.17 acres
\$32 p.s.f.

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Suburban Maryland

Frederick

Market's largest firms expand footprints

- Both land and lab space in Frederick are significantly discounted to the I-270 Corridor, yielding strong demand among more price-conscious tenants and those seeking GMP and incubation facilities.
- Already a significant presence in the region, Thermo Fisher Scientific Dynamics grew its Frederick operations through the March \$11.5 billion acquisition of European pharmaceutical firm Qiagen. Qiagen occupies space at 6951 Executive Way and recently signed a 43,000-s.f. renewal.
- Construction on Kite Pharma's future biomanufacturing facility on a 20-acre site remains ongoing. The eventual 280,000-s.f. facility will serve office, R&D and manufacturing services and employ as many as 900 employees at full capacity. The project is expected to deliver in 2021.
- Core occupiers AstraZeneca and the Leidos Biomedical maintain large market facilities.

Germantown

Spillover demand yields low vacancies

- Located just north of Shady Grove and Gaithersburg, Germantown sees spillover tenant demand that has driven down vacancies in a region with limited lab supply. Germantown has the lowest vacancy rate of any submarket in Suburban Maryland at 2.8 percent.
- Average asking rents for premier product are in the high \$20s NNN, compared to near \$40 NNN in the prime assets farther south.
- Proposed lab developments from Montgomery College and Minkoff Development present 220,000 s.f. of new construction opportunities.
- Since its IPO in 2018, biotechnology firm Senseonics continues to expand by taking an additional 30,500 s.f. via sublease at 1 Milestone Center Drive.

Facilities scorecard

Supply	Frederick	Germantown
Rentable lab stock	1.5M s.f.	762,500 s.f.
Owner-occupied lab stock	403,000 s.f.	168,00 s.f.
(% of total lab stock)	10.3%	5.0%
Total vacancy	3.8%	2.8%
# of large blocks over 50,000 s.f.	N/A	N/A
Under construction (s.f.)	280,000 s.f.	N/A
Demand		
# of requirements (<i>market-wide</i>)		15
Total s.f. requirements		1.3M s.f.
Pricing		
Average asking rent (NNN)	\$15.00 p.s.f.	\$24.50 p.s.f.

Recent activity

Qiagen

6951 Executive Way
Frederick
43,000 s.f.
Renewal

Kite Pharma

Urbana, MD
Frederick County
280,000 s.f.
2021

Senseonics

1 Milestone Center Drive
Frederick County
30,500 s.f.
sublet

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Baltimore

Baltimore Inner-Urban

Premier space is scarce as new projects wait to break ground

- The majority of Baltimore City’s inner-urban lab space is composed of the Johns Hopkins Science & Technology Park and University of Maryland Baltimore Biopark, with less than 1 percent vacancy.
- Institutional and owner-occupied space make up the bulk of supply, while developers have been hesitant to kick off new projects without significant preleasing, despite occupancy rates nearing 100 percent.
- The next pair of buildings scheduled at the UMB Biopark, coupled with the Port Covington project’s plans to explore lab development options, could finally add large blocks of available space to the market and draw new requirements.

Baltimore Outer-Urban

Lack of quality assets yield high vacancies

- The outer-urban supply is composed mainly of buildings at Johns Hopkins Bayview Campus, which are fully leased long-term to the National Institutes of Health.
- Several undesirable lab buildings in the Fort Holabird industrial park are currently empty and bring the outer-urban vacancy rate up to 22.9 percent.

Baltimore Suburbs

Lab space is dispersed and new development is unlikely

- Lab space in suburban Baltimore is scattered throughout various submarkets with no major campus developments apart from bwtech@UMBC.
- Many users have purchased flex buildings and converted them to lab uses as Baltimore City faces a chronic lack of desirable supply.

Facilities scorecard	
Supply	Baltimore
Rentable lab stock	2.5M s.f.
Owner-occupied lab stock	3.5M s.f.
(% of total lab stock)	32.1%
Total vacancy	10.7%
(Change year-over-year)	
# of large blocks over 50,000 s.f.	4
Under construction (s.f.)	0 s.f.
Demand	
# of requirements (market-wide)	4
Total s.f. requirements	90,000 s.f.
Pricing	
Average asking rent (NNN)	\$30.00

Recent activity	
Paragon Bioservices 5521 Research Park Drive BWI Baltimore County 20,695 s.f. New Lease	Illumina 801 W. Baltimore St. Baltimore City SW 11,000 s.f. New Lease
Lieber Institute for Brain Development 855 N. Wolfe St. Baltimore City NW 49,876 s.f. Renewal	
Activity key: Leasing Sales Under construction Large blocks of space	

Minneapolis–St. Paul

Cluster score
16.3

Key insights

Minneapolis–St. Paul is the center of the Medical Alley corridor extending from Duluth to Rochester. In 2019, Minnesota life sciences companies raised a record \$1.1 billion from global investors.

This region hosts one of the world's most successful medical device clusters, a legacy that dates back to the early 20th century and the founding of the industry's grandfathers, 3M and Medtronic.

Talent truly differentiates Minneapolis–St. Paul from the rest of its life sciences peers. The metro is one of the most educated in the nation. Private-sector and institutional research foster a uniquely innovative health tech cluster, evidenced by Minnesota's unprecedented number of patents per capita. Life sciences job counts steadily grow every year, driven by a balanced mix of start-ups, relocations and large, well-established life sciences companies.

The region is a leader in cardiovascular technologies, complex urological devices and complex neurology devices, including the emerging neuromodulation device market.

Minnesota is first nationally in premarket approvals (PMAs) in these fields, which means that companies can get their products to market faster than anywhere else.

Northeast

Life sciences companies occupy more than 6.2 million square feet of office, lab and manufacturing space in the Northeast submarket; more than 87 percent of this space is owner-occupied. Prominent global corporations such as 3M, Medtronic and St. Jude Medical are all headquartered here, as is the University of Minnesota.

Northwest

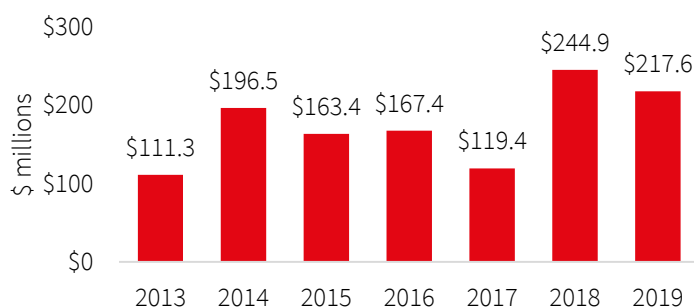
A deep and talented pool of life sciences

workers and a strong cluster of life sciences companies occupy more than 4.2 million square feet of office, lab and manufacturing space. Notable companies with a presence include Baxter, Boston Scientific, Olympus Surgical Technologies America and Upsher-Smith.

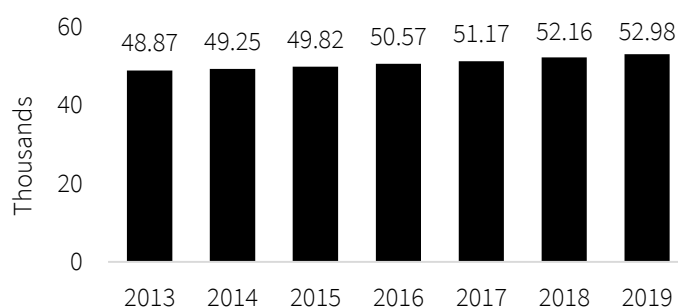
Southwest

Life sciences companies occupy more than 2.3 million square feet of office, lab and manufacturing space in the Southwest market. Major Southwest occupiers include Starkey Hearing Technologies, Beckman Coulter, Bayer CropScience and American Medical Systems.

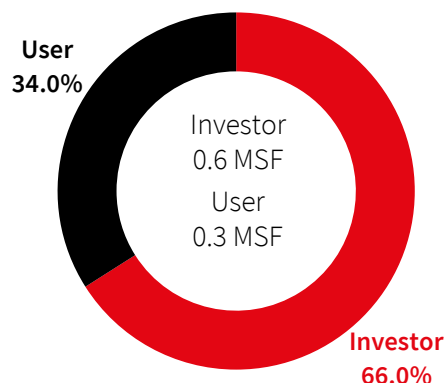
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

Workforce	Total life sciences	% life sciences to private employment	
			Five-year growth
Employment	52,984	2.9%	6.4%
Establishments	771	0.9%	9.4%
Funding	Total life sciences	% to total U.S.	
VC funding	\$217.6M	1.1%	
NIH funding	\$378.0M	1.2%	
Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (NNN)
	0.6M s.f.	24.8%	\$18.00 p.s.f.

New Jersey

Cluster score
30.6

Key insights

In response to the COVID-19 global pandemic, New Jersey's pharmaceutical/life sciences sector is expected to see an increase in GMP requirements internally as well as from overseas.

With its large population base and high concentration of scientists per square mile, the state is expected to be on the radar screen for life sciences companies seeking CAR T-cell therapy facilities.

Northern New Jersey

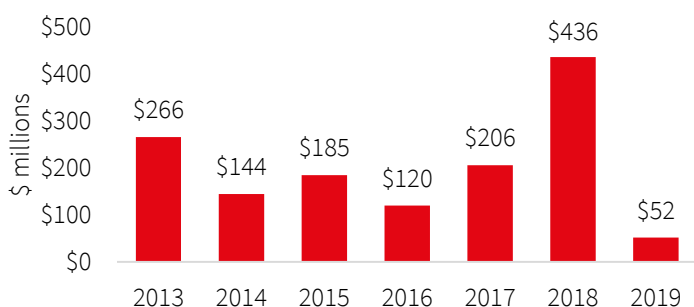
The market includes Bergen, Essex, Hudson, Morris and Passaic Counties, as well as Rockland County, NY. The owner-occupied and leased R&D/lab inventory totals approximately 5.4 million square feet. Novartis and Pfizer occupy significant owned campuses in this region. The largest investment transaction recently completed involved Thor Equities Group's acquisition of 95 Greene St. in Jersey City for \$95.4 million. The 337,890-square-foot building is being repurposed for life sciences, healthcare and technology tenants.

Central New Jersey

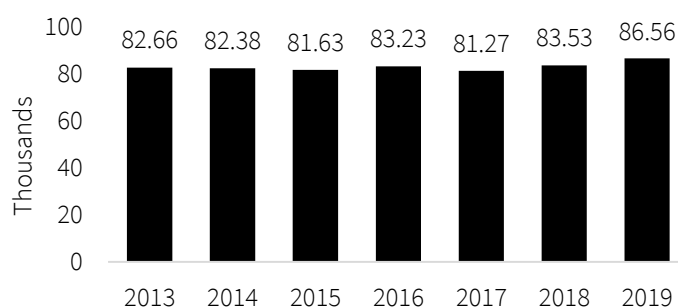
More than 70.0 percent of the R&D/lab space in the state is housed in Central New Jersey, which includes Hunterdon, Mercer, Middlesex, Monmouth, Somerset and Union Counties. Totalling 13.0 million square feet, nearly two-thirds of this space consisted of owner-occupied R&D/lab facilities used for research, manufacturing and support operations. Most of the inventory is focused along the Route 1 corridor from North Brunswick south to Princeton, the Bridgewater area in Somerset County and Kenilworth/Summit in Union County. Merck &

Company generated headlines in Central New Jersey by announcing plans to vacate its 100-acre research and development hub in Kenilworth and move its headquarters back to Rahway by the end of 2023. The pharmaceutical giant moved its headquarters from Rahway to Whitehouse Station in 1992, before relocating to Kenilworth following the Schering-Plough acquisition in 2009.

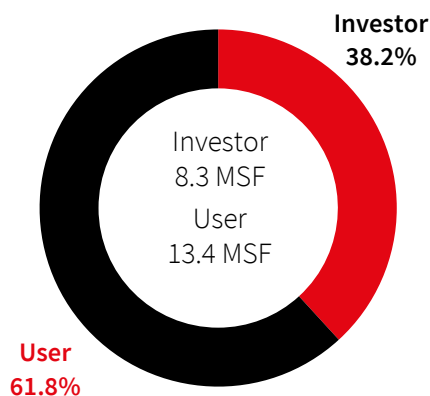
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

Workforce	Total life sciences	% life sciences to private employment	
		Five-year growth	
Employment	86,561	3.0%	6.0%
Establishments	1,965	1.1%	15.0%
Funding	Total life sciences	% to total U.S.	
VC funding	\$51.8M	0.27%	
NIH funding	\$311M	1.0%	
Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (NNN)
	8.3M s.f.	33.9%	\$27.90 p.s.f.

Northern/Central NJ

Northern New Jersey

Thor Equities bringing life sciences space to the Waterfront

- Thor Equities Group purchased 95 Greene St. in Jersey City for \$95.4 million and is repositioning the 337,890-square-foot former office building for pharmaceutical/life sciences tenants.
- Construction continues on Quest Diagnostics' 250,000-square-foot laboratory at ON3, the former Roche Clifton/Nutley research campus. The lab will house more than 1,100 employees and be the largest facility in the Quest network upon opening in 2021.
- The mergers and acquisitions arena remained active, as AbbVie announced its intent to buy Allergan for \$63.0 billion. In addition, Swiss pharmaceutical company Novartis purchased Parsippany-based Medicines Company for \$9.7 billion.

Central New Jersey

Merck & Co. reshuffling its real estate holdings

- Merck & Co. plans to vacate its 100-acre research and development hub in Kenilworth and move its headquarters back to Rahway by year-end 2023. The pharmaceutical giant had moved its headquarters from Rahway to Whitehouse Station in 1992, before relocating to Kenilworth following the Schering-Plough acquisition in 2009.
- Thor Equities Group purchased the 783,500-square-foot NJ Center of Excellence in Bridgewater for \$152.0 million. The former Sanofi U.S. research campus was nearly 90.0 percent leased to multiple life sciences companies at the time of sale, including Amneal Pharmaceuticals, Ashland Chemicals and Nestlé Health Sciences.
- PTC Therapeutics now occupies more than 101,630 square feet at the NJ Center of Excellence. The growing biopharmaceutical company also inked a long-term lease for 220,520 square feet with Bristol-Myers Squibb at its Hopewell campus.

Facilities scorecard

Supply	Northern NJ	Central NJ
Rentable lab stock	3.5M s.f.	4.8M s.f.
Owner-occupied lab stock	2.0M s.f.	8.2M s.f.
(% of total lab stock)	29.5%	70.5%
Total vacancy	32.3%	9.4%
(Change year-over-year)	-0.9 ppts	+3.1 ppts
# of large blocks over 50,000 s.f.	6	8
Under construction (s.f.)	250,000 s.f.	0 s.f.
Demand		
# of requirements	6	31
Total s.f. requirements	200,000 s.f.	2,011,500 s.f.
Pricing		
Average asking rent (NNN)	\$28.29 p.s.f.	\$23.85 p.s.f.
(Change year-over-year)	+12.3%	6.5%

Recent activity

PTC Therapeutics

311 Pennington Rocky Hill Road
Hopewell, NJ/Princeton
220,520 s.f.
R&D/lab lease

PTC Therapeutics

NJ Center of Excellence
Bridgewater, NJ/Route 78
101,630 s.f.
R&D/lab lease

Thor Equities

Advance Realty/
CrossHarbor Capital
NJ Center of Excellence
Bridgewater, NJ/Route 78
783,500 s.f.
\$194 p.s.f.

WuXi Biologics

7 Clarke Drive
Cranbury, NJ/Princeton
65,760 s.f.
R&D/lab lease

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

New York

Cluster score
43.7

Key insights

New York City is rapidly emerging as a top life sciences cluster based on its access to healthcare and life sciences workforce, world-class hospitals and top-tier universities.

Supply is positioned to grow as prominent life sciences landlords continue to acquire development sites and convert industries properties for life sciences use.

New York City

The life sciences inventory has been rapidly expanding in the past few years based on the parallels that are being drawn to established life sciences markets and local specialized industry segments. There is more than 2.0 million s.f. of existing lab inventory, with almost double that amount in the pipeline that could deliver in the next five years. The supply is concentrated within various sub-clusters throughout the city, which offer different price points and proximity to public transportation, hospital systems and universities.

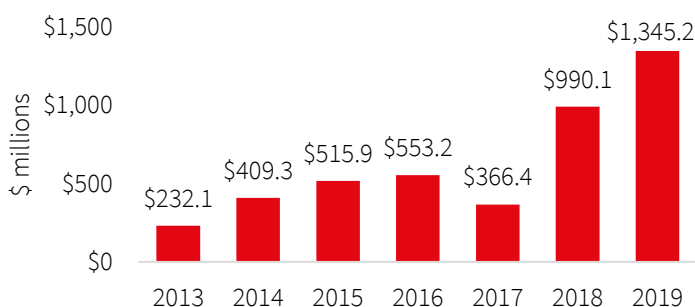
Westchester

With its proximity to major research institutions as well as easy access to NYC, Westchester County has cemented itself as a bioscience hub within the region. The industry employs over 8,000 professionals in the county, which is nearly 20.0 percent of New York State's biotech workforce. Key life sciences players have looked to expand their portfolios over the past decade, including Regeneron Pharmaceuticals, which is the state's largest biotech company and occupies 65.0 percent of the total 2.3 million s.f. of existing lab inventory in Westchester.

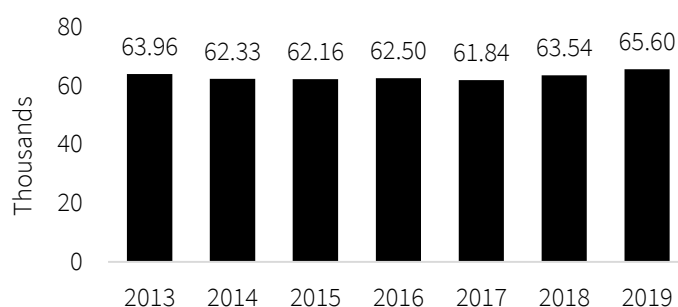
Long Island

Recognized for its world-class research institutions, the Long Island bioscience industry is a major source of local economic growth. Through a partnership of renowned organizations, Stony Brook University, Brookhaven National Laboratory, Cold Spring Laboratory and Feinstein Institute for Medical Research adjoin their research expertise to further develop the bioscience hub. There is close to 2.7 million s.f. of existing lab inventory across Nassau and Suffolk Counties, 11.0 percent of which is currently available for sale and lease.

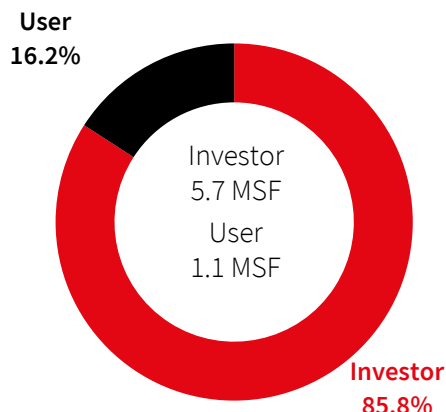
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

	% life sciences to private		
Workforce	Total life sciences	employment	Five-year growth
Employment	65,601	1.0%	5.5%
Establishments	2,419	0.5%	5.7%
Funding	Total life sciences	% to total U.S.	
VC funding	\$1,345M	7.0%	
NIH funding	\$2,400M	7.7%	
Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (NNN)
	5.7M s.f.	15.9%	\$80.35 p.s.f.

New York

New York City

More than 2.0M s.f. of future supply is expected

- In 2019, Deerfield Management acquired 345 Park Ave. South for \$344.5 million and is currently working to convert part of the former office property into lab and incubator space. Situated in the transit-oriented Flatiron/Union Square submarket, it will offer 300,000 square feet of office and lab-ready space, with the top four floors slated to be owner-occupied by Deerfield. The plans also include amenities that would befit a modern office building, such as a rooftop terrace and a newly renovated lobby. This life sciences property will be the first of its kind that is redeveloped within a commercial (C-6) zoning district in New York City.
- Taconic Partners and Nuveen purchased a portion of the former ABC campus near Columbus Circle from Silverstein Properties. The three-building portfolio includes 125 West End Ave., which is set to be converted from office to life sciences use. Previously sold by ABC to Silverstein Properties, all three properties have three years of lease term remaining with ABC before they can be redeveloped.
- Alexandria Real Estate Equities recently purchased 47–50 30th Street in Queens from Prestone Realty for \$25.0 million. The existing property stands at 52,500 square feet but has 112,200 square feet of development potential. This is the second acquisition in Queens by Alexandria Real Estate Equities in the past two years. Last year, the firm acquired the Bindery at 30-02 48th Ave. for \$240.0 million, which will add approximately 175,000 square feet of life sciences space to the market.
- Elsewhere, Alexandria Real Estate Equities is planning to launch construction of the North Tower at its Alexandria Center for Life Science campus in Midtown East. This project would expand its campus to more than 1.0 million square feet.
- At 525 West 57th Street in the Midtown West submarket, CBS vacated the base floors and LabCorp decreased its footprint, creating 100,900 square feet of available space with asking rents in the low-\$80s per square foot NNN.

Facilities scorecard

Supply	New York City
Rentable lab stock	2.1M s.f.
Owner-occupied lab stock	0.3M s.f.
(% of total lab stock)	34.4%
Total vacancy	18.1%
(Change year-over-year)	-1.0 ppts
# of large blocks over 50,000 s.f.	5
Under construction (s.f.)	2,575,000 s.f.
Demand	
# of requirements	N/A
Total s.f. requirements	
Pricing	
Average asking rent (NNN)	\$86.64 p.s.f.
(Change year-over-year)	+8.0%

Recent activity

Cure 345 Park Ave. South Manhattan 310,000 s.f. Class A	47–50 30th St. Long Island City 52,000 s.f. Class A
125 West End Ave. Manhattan 516,000 s.f. Class A	525 West 57th St. Manhattan 100,900 s.f. Class A

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Westchester

Westchester County

Life sciences companies expand their footprints

- The life sciences inventory has historically comprised owner-occupied assets until Bank of America entered a participation agreement with Regeneron to acquire the 1.0 million-square-foot headquarters location in Tarrytown, New York, in 2019, establishing Bank of America as the new owner of the complex. The R&D life sciences complex was provided \$720 million in leasing financing through the acquisition.
- According to research conducted by BioMed, due to the highly specialized nature of life sciences tenant build-outs, there have been considerable limitations on space options for smaller tenants in the market, as they typically cannot afford the expense of outfitting their own lab space.
- BioMed, the owner of Ardsley Park, recently received final approval and \$905,000 in tax incentives for a \$38 million renovation at Buildings 430 and 440. Ardsley Park features 43 acres and 258,754 square feet of office and lab space in four buildings located in Ardsley, New York.
- The approval issued by the Westchester County Industrial Development Agency will allow BioMed to undergo approximately 100,000 square feet of renovations for brand-new lab and office spaces. The Westchester Industrial Development agency estimates that the project could create an additional 354 jobs in the county, with an annual payroll of approximately \$35 million.
- The 22,000-square-foot renovation at Building 440 will help accommodate up to four life sciences companies. Renovations of the 75,000 square feet at Building 430 will be designed to house up to six life sciences companies. BioMed Realty plans for the space to be marketed to smaller tenants, including start-up biotech companies, and will provide them a ready-to-occupy space.

Facilities scorecard

Supply	Westchester
Rentable lab stock	2.3M s.f.
Owner-occupied lab stock	0.3M s.f.
(% of total lab stock)	38.0%
Total vacancy	3.6%
(Change year-over-year)	-5.2 ppts
# of large blocks over 50,000 s.f.	1
Under construction (s.f.)	0 s.f.
Demand	
# of requirements	0
Total s.f. requirements	0 s.f.
Pricing	
Average asking rent (NNN)	\$25.00 p.s.f.
(Change year-over-year)	0%

Recent activity

Ardsley Park

430 & 440 Saw Mill River Road
Ardsley, NY
100,000 s.f.
Class B

Activity key:

Leasing

Sales

Under construction

Large blocks of space

Long Island

Nassau County

Large-block leasing activity drives vacancy lower

- New York Institute of Technology in Old Westbury expanded its existing research facility, opening a \$750,000 bioscience and bioengineering lab, which will serve as a space for faculty and students. The 1,000-square-foot project was supported by a \$150,000 Empire State Development grant in an effort to further the development of Long Island's biotech talent pipeline.
- ChemRX Pharmacy Services LLC, a pharma company that supplies surgical supplies to nursing homes, leased 60,000 square feet of office and lab space at 51 Charles Lindbergh Blvd. in Uniondale.
- North Carolina-based LabCorp fulfilled its lab/office/warehouse space requirement through a 13,605-square-foot lease at 51 E. Bethpage Road in Plainview.

Suffolk County

Biopharma leads growth in Western and Central Suffolk

- The Suffolk IDA issued a preliminary approval of a tax-abatement deal for ScieGen Pharmaceuticals to expand its manufacturing capacity and redevelop two-thirds of its 92,000-square-foot facility at 330 Oser Ave. in Hauppauge. The \$15.5 million expansion project will convert 65,000 square feet of existing warehouse space into new lab and office facilities.
- The 103,530-square-foot R&D site at 49 Mall Drive in Commack is available for sale and will offer 23,519 square feet of lab space. The space stands as the largest available block in Suffolk County.
- In 2019, Time-Cap Laboratories leased 59,850 square feet at 260 Spagnoli Road in Melville, expanding its pharmaceutical manufacturing footprint on Long Island.

Facilities scorecard

Supply	Nassau County	Suffolk County
Rentable lab stock	0.7M s.f.	0.2M s.f.
Owner-occupied lab stock	0.5M s.f.	0.4 s.f.
(% of total lab stock)	18.0%	10.0%
Total vacancy	6.7%	19.8%
(Change year-over-year)	-0.6 ppts	0.0 ppts
# of large blocks over 50,000 s.f.	1	1
Under construction (s.f.)	0 s.f.	0 s.f.
Demand		
# of requirements	0	1
Total s.f. requirements	0 s.f.	100,000 s.f.
Pricing		
Average asking rent (NNN)	\$21.88 p.s.f.	\$25.00 p.s.f.
(Change year-over-year)	+0.1%	0.0%

Recent activity

Time-Cap Laboratories

260 Spagnoli Road
Melville
147,978 s.f.
Expansion

ChemRX Pharmacy

51 Charles Lindbergh Blvd.
Uniondale
60,000 s.f.
New Lease

103,530 s.f.
49 Mall Drive
Commack
Class A

62,000 s.f.
Broad Hollow Bioscience Park
Farmingdale
Class A

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Philadelphia

Cluster score
49.5

Key insights

In 2019, life sciences firms attracted a record \$1.04 billion in venture series investments across 32 separate transactions.

Philadelphia's extensive pipeline of life sciences talent led by the University of Pennsylvania and Drexel University helped the region land over \$1.2 billion in NIH funding in 2019.

University City

With more than \$450M of venture capital raised by life sciences startups in 2019, sentiment remains bullish in University City. Ventas and Wexford's development at One uCity Square is under way, and University Place Associates are pushing to get 3.0 University Place out of the ground. Asking rents for the aforementioned buildings are each pushing \$50.00 p.s.f. NNN. Availability rates and asking rents among the lab stock in University City continue to outperform the market as a whole and currently sit at 2.8 percent and \$57.65 FSG, respectively.

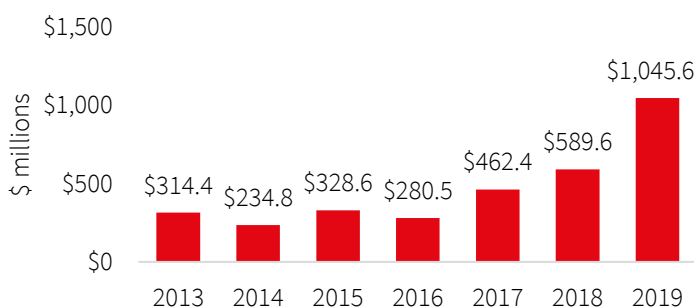
The Navy Yard

There hasn't been vacancy among the lab supply since before 2016 in the Navy Yard. This continues to present both an opportunity and a challenge for landlords and tenants alike. Gattuso Development Partners is working to develop another 110K s.f. of lab supply. Norvin Properties, a healthcare-focused PE firm, and Ensemble recently made a splash at the Navy Yard when they acquired 3 Crescent Drive for \$62.3M (\$654 p.s.f.). Iovance and WuXi's development in the Navy Yard will deliver before 2021 and will add another 230K s.f. of single-tenant office space.

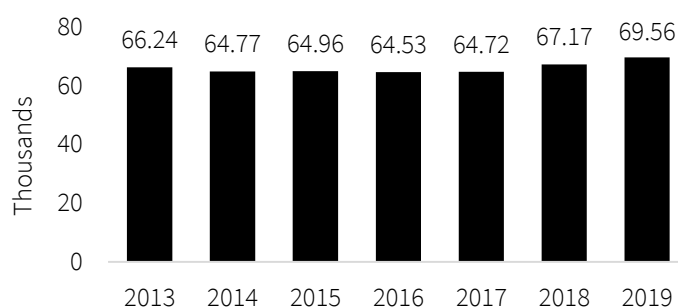
Greater Philadelphia

COVID-19's impact on commercial real estate may present a once-in-a-lifetime opportunity for owners of lab space in Greater Philadelphia. Larger floor plans will offer tenants the opportunity to spread out and pay less on a p.s.f. basis. An undersupply of lab space prompted the development of Discovery Labs in King of Prussia. Moreover, the maturing millennial talent might see the pandemic as an impetus to make the migration back to the suburbs. Look for rents and vacancy rates among the Greater Philadelphia lab supply to trend positively.

VC funding

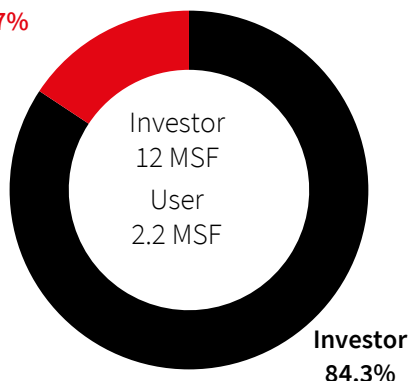


Life sciences jobs



Ownership share

User
15.7%



Economic indicators overview

		% life sciences to private employment	
Workforce	Total life sciences		Five-year growth
Employment	69,565	2.5%	7.1%
Establishments	1,738	1.1%	4.4%
		% to total U.S.	
Funding	Total life sciences		
VC funding	\$1,045M	5.5%	
NIH funding	\$1,173M	3.8%	
Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (FSG)
	12.0M s.f.	5.2%	\$34.00 p.s.f.

Urban Philadelphia

University City

Firms focused on gene and cell therapies continue to cluster and incubate in University City

- Four of the top five recipients of venture capital funding in Philadelphia call University City home and raised a cumulative \$450M. Ventas and Wexford Science & Technology broke ground in Q4 2019 on its 390K s.f. lab and office development at One uCity Square. Construction at One uCity Square has been paused due to COVID-19. Cambridge Innovation Center, Integral Molecular and Century Therapeutics each signed long-term leases at the new development.
- University Place Associates (UPA) is actively marketing its proposed 3.0 University Place to life sciences tenants in hopes of a summer groundbreaking. Thus far, the Barer Institute and the Wistar Institute have committed to space in the building.
- A number of tenants are expanding their footprints in University City and beyond: Limelight Bio moved into 25K+ s.f. at 3535 Market St. after raising \$75 million in a venture series that closed in Q4 2019. Passage Bio increased its footprint by about 29K s.f. at One Commerce Square.

The Navy Yard

Speculative investment picking up as the area's cache grows

- Prologis's acquisition of Liberty Property Trust led to the sale of 3 and 5 Crescent Drive. Norvin Properties, a healthcare-focused private-equity firm, acquired 3 Crescent, which Jefferson Health occupies, for \$62.3M (\$654 p.s.f.), and Ensemble Real Estate Solutions acquired 5 Crescent Drive for \$130.5M (\$628 p.s.f.).
- Two build-to-suit R&D facilities will deliver by early 2021 on adjacent parcels: Iovance's East Coast headquarters will occupy 300 Rouse Blvd. (136K s.f.) and WuXi's fourth Navy Yard building will be 95K s.f. at 400 Rouse Blvd.
- Gattuso Development Partners are proposing a 110,000-s.f. build-to-suit life sciences building at 2500 League Island Blvd.

Facilities scorecard

Supply	Urban
Rentable lab stock	3.3M s.f.
Owner-occupied lab stock (% of total lab stock)	1.6M s.f. 27.3%
Total vacancy (Change year-over-year)	4.5% -3.0 ppts
# of large blocks over 50,000 s.f.	1
Under construction (s.f.)	694,000 s.f.
Demand	
# of requirements	3
Total s.f. requirements	144,000 s.f.
Pricing	
Average asking rent (FSG) (Change year-over-year)	\$57.65 p.s.f. 32.4%

Recent activity

Passage Bio

2005 Market St.
Philadelphia
37,414 s.f.
Expansion

Norvin Properties & Ensemble Real Estate

Liberty Property Trust
3 & 5 Crescent Drive
Philadelphia
303,040 s.f.
\$636.35 p.s.f.

One uCity Square

3699 Warren St.
Philadelphia
390,000 s.f.
5/2021

265,000 s.f.

One uCity Square
Philadelphia
Trophy
\$60.00 FSG

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Suburban Philadelphia

(Route 202 Corridor from Plymouth Meeting to Exton)

With demand growing rapidly as firms mature and supply nears zero, the suburbs are a hotbed of leasing and development activity

Leasing & sales

- Plymouth Meeting-based Inovio Pharmaceuticals has emerged as a front-runner in the race to develop a vaccine for COVID-19. Inovio and its offshoot, Geneos, occupy 20K s.f. in Plymouth Meeting.
- Ethos Biosciences signed a 10-year lease at 3805 West Chester Pike in Newtown Square to occupy 13K s.f.
- Frontage Laboratories signed a 15-year, 71,215-s.f. lease at 750 Pennsylvania Drive in Malvern.
- Rubenstein Partners acquired the Chesterbrook portfolio in King of Prussia/Wayne, which includes Aclaris Therapeutics and AmerisourceBergen, for \$148.5M at \$142 p.s.f.

VC funding

- Suvoda, a software developer for clinical trials, raised \$40M in December 2019. It is currently in the market with a 70K-s.f. requirement and is considering Seven Tower Bridge, which is currently under construction and the future home to anchor-tenant Hamilton Lane.
- Exton-based Castle Creek Biosciences raised \$55M in a venture series in Q1 2020 amid the coronavirus outbreak.

Development & investment

- Developer Brian O'Neill, who founded Discovery Labs, has forged a partnership with Deerfield Management Co. to create a Center for Breakthrough Medicine, which will occupy roughly 680K s.f. of the 1M+-s.f. campus. Multinational firm WuXi Biotech recently signed a 33K-s.f. lease at the Discovery Labs campus. This is a spinout of WuXi AppTec, which will maintain and grow its presence at the Navy Yard.

Facilities scorecard

Supply	Suburban
Rentable lab stock	8.7M s.f.
Owner-occupied lab stock (% of total lab stock)	635K s.f. 72.7%
Total vacancy (Change year-over-year)	4.3% +1.5 ppts
# of large blocks over 50,000 s.f.	4
Under construction (s.f.)	0 s.f.
Demand	
# of requirements	1
Total s.f. requirements	24,000 s.f.
Pricing	
Average asking rent (FSG) (Change year-over-year)	\$32.25 p.s.f. 15.2%

Recent activity

WuXi Biologic

411 Swedeland Road
King of Prussia
33,000 s.f.
Expansion

Rubenstein Partners

Pitcairn
640 Lee Road
Wayne
74,516 s.f.
\$141.63 p.s.f.

Frontage Labs

750 Pennsylvania Drive
Malvern
71,215 s.f.
Relocation

436,095 s.f.

Discovery Labs
King of Prussia
Class A
\$31.00 FSG

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Raleigh-Durham

Cluster score
49.7

Key insights

Raleigh-Durham, anchored by three Tier 1 universities, is recognized nationally as a top life sciences hub. A highly educated talent pool fuels the market's popularity among companies.

Of the 700+ life sciences companies located in North Carolina, nearly 600 are located in Raleigh-Durham. The market's reputation has created an unparalleled cluster of innovation.

Downtown Durham

Downtown Durham's urban environment fosters a uniquely innovative ecosystem for biotech and life sciences companies looking to capitalize on a downtown setting. Its proximity to Duke University has led to a number of partnerships backed by the university that have nurtured the entrepreneurial spirit of the submarket. As the market's primary urban option for life sciences tenants, Downtown Durham is especially popular among start-ups.

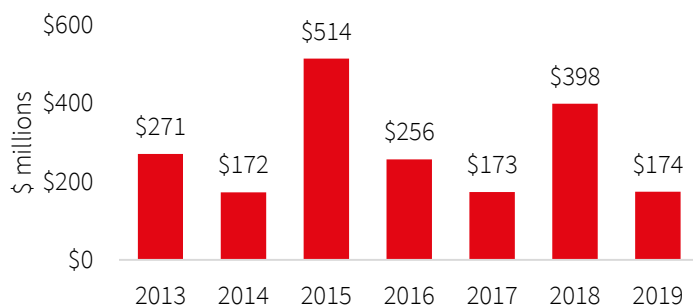
West Raleigh

The West Raleigh submarket is home to North Carolina State University (NCSSU) and its Centennial Campus. The university leads the development of the majority of lab space in the West Raleigh submarket, which houses university, government and private tenants. Centennial Campus has become a core research-oriented micromarket thanks to its immediate access to educated talent and university-facilitated corporate-partnered research in a thriving collegiate environment.

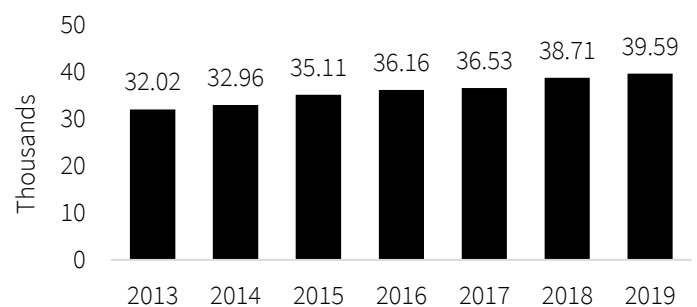
RTP/RDU

Centrally located between Raleigh, Durham and Chapel Hill, RTP/RDU is the heart of Raleigh-Durham's life sciences cluster. The Research Triangle Park, located within the submarket, is one of the largest research parks in the United States and home to over 300 companies. Since its inception in the 1950s, Research Triangle Park has grown to include industry giants such as Monsanto, Bayer CropScience, BASF, GlaxoSmithKline, LabCorp and Biogen.

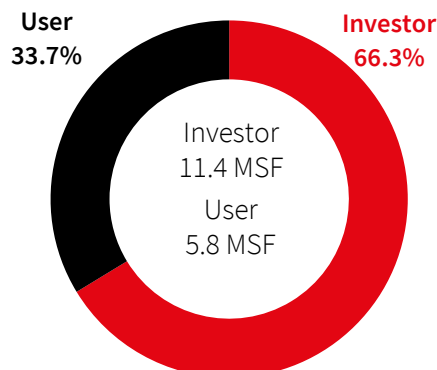
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

		% life sciences to private employment	Five-year growth
Workforce	Total life sciences		
Employment	39,588	4.6%	12.7%
Establishments	1,072	2.1%	22.5%
Funding	Total life sciences	% to total U.S.	
VC funding	\$174M	0.9%	
NIH funding	\$1,404M	4.5%	
Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (NNN)
	11.4M s.f.	9.5%	\$21.78 p.s.f.

Downtown Durham

Minimal availabilities persist in urban submarket

- Downtown Durham continues to be an in-demand submarket among tenants. The submarket continues its streak of minimal availabilities, posting a vacancy rate of 1.5 percent.
- Durham Innovation District's master plan calls for the development of additional lab space. The development, spearheaded by Longfellow, has two existing 160,000-square-foot buildings, one of which is fully leased to Duke Clinical Research.
- The Triangle Biotechnology Center sold as part of a two-property portfolio in March 2020. Arcos Properties purchased the building for \$6.5 million, approximately \$353.91 per square foot.

Facilities scorecard

Supply	Downtown Durham	West Raleigh
Rentable lab stock	403K s.f.	268K s.f.
Owner-occupied lab stock	284K s.f.	134K s.f.
(% of total lab stock)	4.2%	2.3%
Total vacancy	1.5%	0.6%
(Change year-over-year)	+1.5 ppts	+0.1 ppts
# of large blocks over 50,000 s.f.	0	0
Under construction (s.f.)	0 s.f.	225,000 s.f.
Demand		
# of requirements	4	2
Total s.f. requirements	202,000 s.f.	300,000 s.f.
Pricing		
Average asking rent (NNN)	\$33.00 p.s.f.	\$31.50 p.s.f.
(Change year-over-year)	+11.9%	0.0%

West Raleigh

Activity hot around NC State's Centennial Campus

- Minimal availability in West Raleigh has limited the submarket's activity. Vacancy is currently 0.6 percent, a 0.1 percent increase in year-over-year comparisons.
- In March 2020, Ventas purchased two buildings on Centennial Campus from the Keystone Corporation. The properties, totaling 175,434 square feet, sold for \$80,000,000, approximately \$456.01 per square foot. Both buildings were 100.0 percent leased at the time of sale.
- The Biomedical Partnership Center, which delivered in 2017, has 2,433 square feet available for lease and is the only availability in the submarket.

Recent activity

Nutanix

610 W. Main St.
614 W. Main St.
Durham
40,000 s.f.
New lease

Ventas

Keystone Corporation
1010 Main Campus Drive
1791 Varsity Drive
Raleigh
175,434 s.f.
\$456.01 p.s.f.

NC Department of Agriculture

4300 Reedy Creek Road
Raleigh
225,000 s.f.
June 2020

Camargo Pharmaceuticals

800 Taylor St.
Durham
14,000 s.f.
New lease

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

RTP/RDU

Expansions and acquisitions fuel submarket activity

- Longfellow Real Estate Partners acquired Perimeter's Edge, adding more than 400,000 square feet to its Raleigh-Durham portfolio. Longfellow paid \$64.7 million for the five-property flex portfolio, approximately \$161 per square foot. Significant improvements are planned for the park, including the conversion of vacant spaces to lab facilities.
- Longfellow also purchased 1035 Swabia Court. The 112,340-square-foot facility sold for \$12.2 million, or \$101 per square foot. Similar to Perimeter's Edge, Longfellow plans to upgrade the property, creating new opportunities for life sciences tenants.
- 8 Davis Drive, situated across from Syngenta's campus in RTP, is a proposed office and lab development from Alexandria Real Estate Equities. The project is expected to be 117,855 square feet.
- Asklepios BioPharmaceutical (AskBio) signed a lease for 86,000 square feet at BioPoint Innovation Labs, more than doubling its original 36,000-square-foot space. The lease officially brings the property to 100 percent occupancy. Longfellow acquired and redeveloped BioPoint in 2017.
- Renovations are under way at the Park Point development, the 650,000-square-foot former Nortel Networks campus. Starwood Capital Group, Vanderbilt Partners and Trinity Capital Advisors is investing more than \$120 million in the project with the intent of creating a life sciences and creative campus.
- After announcing plans for a new life sciences manufacturing facility in Durham, Eli Lilly purchased 110 acres from Karlin Real Estate for \$36.0 million in Research Triangle Park. The new plant is expected to add more than 460 jobs.
- Across the submarket, landlords are recognizing the value proposition of lab space. Due to increased demand from life sciences tenants, landlords are purchasing and renovating flex buildings to suit lab functions.

Facilities scorecard

Supply	RTP/RDU
Rentable lab stock	8.3M s.f.
Owner-occupied lab stock (% of total lab stock)	1.9M s.f. 62.6%
Total vacancy (Change year-over-year)	12.5% -7.3 ppts
# of large blocks over 50,000 s.f.	9
Under construction (s.f.)	740,000 s.f.
Demand	
# of requirements	9
Total s.f. requirements	567,000 s.f.
Pricing	
Average asking rent (NNN) (Change year-over-year)	\$24.60 p.s.f. +7.7%

Recent activity

UCB Biosciences

4000 Paramount Parkway
Morrisville
50,000 s.f.
New lease

Longfellow

Singerman Real Estate
Perimeter's Edge
Morrisville
401,175 s.f.
\$161.28 p.s.f.

Park Point

4001 NC Highway 54
Durham
650,000 s.f.
March 2021

AskBio

BioPoint Innovation Labs
RTP
86,000 s.f.
Expansion

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

San Diego

Cluster score
57.3

Key insights

The San Diego life sciences market has benefited from the rebound in the public markets and VC funding. Biotech tenants in the market have not been as impacted compared to other industries from COVID-19.

Recent shock to the economy has caused some companies to put expansion plans on hold or shift to short-term leases. There continues to be biotech firms actively negotiating deals to accommodate growth needs.

Torrey Pines

Home to San Diego's largest concentration of lab space, the submarket is adjacent to UC San Diego and the Pacific Ocean. Torrey Pines acts as the epicenter of San Diego's life sciences market. It is home to acclaimed research institutes and pharmaceutical and biotechnology companies. Two of the largest capital events in 2020 so far were received by Torrey Pines companies; Zentalis Pharmaceuticals completing a \$165M IPO and Erasca's \$200M Series B.

Diego and is composed of mature, publicly traded companies with advanced product development. The submarket is located in an area that offers numerous amenities to tenants via a large upscale shopping mall and other sizable shopping centers. UTC is also home to one of San Diego's largest Class A office submarkets.

Sorrento Mesa

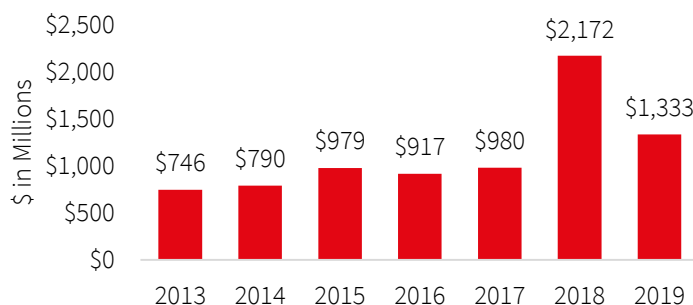
Sorrento Mesa caters to all tiers of life sciences companies and sometimes acts as a value alternative to Torrey Pines or UTC. Sorrento Mesa was formed as developers saw opportunities for greater returns through the conversion of

office buildings into wet lab facilities. Sorrento Mesa is the fastest-growing lab submarket and is slated for an additional 1 million square feet of new supply over the next three years. Torrey Pines, UTC and Sorrento Mesa have several life sciences firms responding to COVID-19.

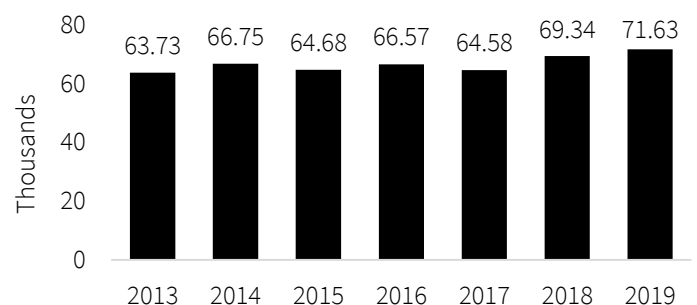
Sorrento Valley

Developed as an ancillary market to Torrey Pines. With a base of older industrial and flex buildings that have been converted to lab space, this submarket has historically provided a more economical alternative for early- and mid-stage companies.

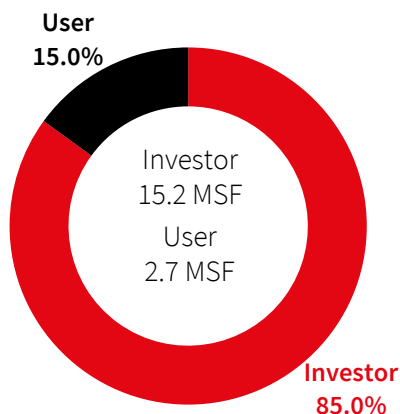
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

Workforce	Total life sciences	% life sciences to private employment		Five-year growth
Employment	71,626	4.8%		10.7%
Establishments	1,734	1.5%		22.5%
Funding	Total life sciences	% to total U.S.		
VC funding	\$1,333M	6.9%		
NIH funding	\$1,013M	3.3%		
Inventory (Investor-owned)	Total supply	% total vacancy		Average asking rent (NNN)
	15.2M s.f.	10.3%		\$52.56 p.s.f.

Torrey Pines & UTC

Torrey Pines

High demand drives rents higher and speculative development

- Torrey Pines led the core life sciences submarkets in leasing activity in Q1, securing six completed transactions for a total of 103,263 square feet.
- Zentalis Pharmaceuticals signed a new lease in Torrey Pines for nearly 37,000 s.f., growing its footprint by 232 percent.
- Currently, there are three speculative projects under redevelopment, including Spectrum V for 116,556 s.f., Aura for 82,089 s.f. and Muse for 185,978 s.f. Two new ground-up developments are under construction, including Boardwalk totaling 195,825 s.f. and Spectrum III for 135,000 s.f.
- Torrey Pines continues to be the highest-rent submarket in the market with Class A average asking rents at \$62.04 triple net per annum.

UTC/Campus Pointe

Tightest submarket, positioned for future new development activity

- Biologix completed a sublease transaction for 10,000 s.f. in UTC, doubling the size of its premises.
- With limited large-block options, UTC ended Q1 as the lowest direct vacancy submarket at 3.6 percent.
- UTC/Campus Point saw four new sublease vacancies listed on the market, totaling approximately 140,000 square feet. This new availability combined with the absence of large tenant activity in the first quarter were the key drivers causing total availability to grow.
- Including sublease space, current total availability is at 7.5 percent.

Facilities scorecard

Supply	Torrey Pines	UTC
Rentable lab stock	3.4M s.f.	3.9M s.f.
Owner-occupied lab stock	2.5M s.f.	160K s.f.
(% of total lab stock)	29.6%	20.4%
Total vacancy	7.9%	3.6%
(Change year-over-year)	+140 ppts	-400 ppts
# of large blocks over 50,000 s.f.	6	1
Under construction (s.f.)	330,825 s.f.	0 s.f.
Demand		
# of requirements	18	8
Total s.f. requirements	471,000 s.f.	195,000 s.f.
Pricing		
Average asking rent (NNN)	\$58.80 p.s.f.	\$54.96 p.s.f.
(Change year-over-year)	+12%	+5.0%

Recent activity

Agilent Technologies

11011 N. Torrey Pines Road
San Diego
32,265 s.f.
Renewal

Dermtech

11099 N. Torrey Pines Road
San Diego
13,300 s.f.
Expansion

Muse Torrey Pines

3030-3050 Science Park Road
San Diego
185,978 s.f.
November 1, 2020

Aura

11010 Torreyana Road
San Diego
82,089 s.f.
Class A

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Sorrento Mesa & Sorrento Valley

Sorrento Mesa

Leading submarket for 12-month rent growth

- Mapp Bio finalized a lease in Sorrento Mesa to move into a new 27,865-s.f. facility. The company will be more than doubling its lab.
- The year-over-year increase in total availability was propelled by the addition of three office-to-lab redevelopments.
- 5580–5590 Morehouse Drive totaling 120,000 s.f. was acquired by Phase 3 Real Estate and 5505 Morehouse Drive, a new 75,424-s.f. vacant office building purchased by Alexandria, who plans to convert it to lab use.
- High demand and a pipeline of new Class A lab redevelopment have caused rents to increase by 17 percent over the last 12 months.

Sorrento Valley

Strong rent growth, but largest increase in availability due to continued spec redevelopment

- In Q1 2020, Sorrento Valley followed behind Torrey Pines with 76,330 square feet of total leasing among seven completed transactions.
- Although Sorrento Valley has the lowest overall asking rents in the core biotech cluster, the submarket posted the same year-over-year double-digit increase as Torrey Pines, at 12 percent.
- Driven by the continued redevelopment of flex and office space into lab space, Sorrento Valley had the largest 12-month increase for direct availability at 810 basis points. Currently, it is the highest core submarket at 14.5 percent direct availability. Furthermore, total availability is at 16.6 percent, which is primarily in the Class B segment.

Facilities scorecard

Supply	Sorrento Mesa	Sorrento Valley
Rentable lab stock	4.2M s.f.	1.1M s.f.
Owner-occupied lab stock	857K s.f.	36K s.f.
(% of total lab stock)	25.4%	7.3%
Total vacancy	11.5%	14.5%
(Change year-over-year)	+570 ppts	+810 ppts
# of large blocks over 50,000 s.f.	7	0
Under construction (s.f.)	305,567 s.f.	0 s.f.
Demand		
# of requirements	14	4
Total s.f. requirements	1,000,014 s.f.	70,000 s.f.
Pricing		
Average asking rent (NNN)	\$49.92 p.s.f.	\$46.56 p.s.f.
(Change year-over-year)	+17%	+12%

Recent activity

Mapp Bio

4921 Directors Place
San Diego
27,865 s.f.
Relocation

Harrison Street Capital

Bioscience Properties
TEN770 & 6325 Lusk Blvd.
San Diego
233,570 s.f.
\$678 p.s.f.

Genesis Science Center

Sorrento Mesa
San Diego
250,000 s.f.
September 1, 2020

San Diego Tech

9805 Scranton Road
San Diego
111,084 s.f.
Class A

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

North County

Carlsbad, Del Mar Heights, I-15 Corridor

2020's largest lab lease is in the I-15 Corridor

- The largest lab deal in Q1 2020 was Fate Therapeutics signing a lease in January for 198,880 square feet at the former Dart Neuroscience building on the I-15 corridor.
- The North County submarkets posted the highest amount of large-block leasing in Q1 2020, totaling over 344,988 square feet.
- Another emerging life sciences submarket located north of the core cluster includes Del Mar Heights/Carmel Valley. Del Mar Heights is anchored by Acadia Pharmaceuticals and Neurocrine Biosciences. Besides these two large companies, the small to midsize leasing has been active for the life sciences in Del Mar Heights. A notable speculative life sciences and technology park development that is now under way is Aperture Del Mar. The first phase totals 229,042 s.f., which has entitlements up to 637,876 s.f. This project is the only life sciences availability that is over 50,000 s.f. outside the core biotech cluster.
- The majority of the North County wet lab inventory is based in the Oceanside and Carlsbad submarkets. The North County anchor biotech companies include Genoptix, Ionis Pharmaceuticals, Thermo Fisher Scientific, Abbott Laboratories, Millipore Sigma and Genentech.
- The North County area has been among the leaders in delivering new industrial and R&D product in this cycle. With limited space available in North County's life sciences product, a push in demand could woo some of the new creative industrial and R&D landlords to build out lab space.

Facilities scorecard

Supply	North County
Rentable lab stock	2.6M s.f.
Owner-occupied lab stock (% of total lab stock)	845K s.f. 17.3%
Total vacancy (Change year-over-year)	6.9% -510 ppts
# of large blocks over 50,000 s.f.	2
Under construction (s.f.)	286,235 s.f.
Demand	
# of requirements	4
Total s.f. requirements	160,000 s.f.
Pricing	
Average asking rent (NNN) (Change year-over-year)	\$30.00–48.00 p.s.f. +10–15%

Recent activity

Fate Therapeutics

12278 Scripps Summit Drive
San Diego
198,880 s.f.
Class A

Aperture Del Mar

Carmel Valley Road
San Diego
229,042 s.f.
Class A

Ionis Pharmaceuticals

2850 Gazelle Court
Carlsbad
69,000 s.f.
Class A

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

San Francisco Bay Area

Cluster score
73.3

Key insights

Office-to-lab conversions have been the most convenient solution in addressing near-term space shortfalls caused by explosive growth born from an abundance of funding and innovation.

Strong sector indicators signify resilient demand drivers that will continue to exert upward pressure on rental rates on top of increased demand for highly amenitized projects.

In March, COVID-19 impacted markets region-wide. Though impacts on certain industries have been significant, the life sciences sectors have shown consistent demand in prior quarters and have exhibited stable behavior as most of the COVID-19 impacts unfold. This is prominent for companies with business interests tied closely to finding health solutions, and especially for those specifically able to pivot their research toward COVID-19 treatments and vaccinations, such as Grifols, Gilead and Dynavax, among many others. The sector may potentially emerge from this event in

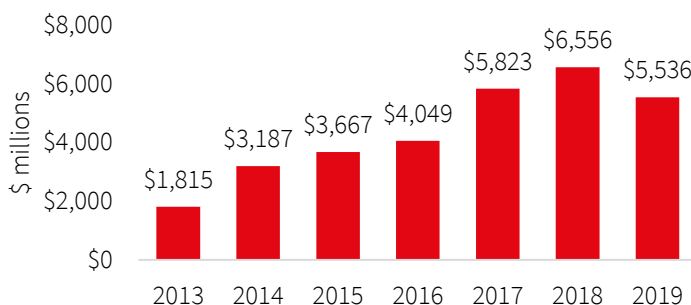
an even stronger position, while the shortfall in lab supply across the region will further encourage rapid ground-up development and office-to-lab conversions as rents reach cyclical highs.

Demand continues to jump as venture capital, NIH grants and successful IPOs allow for plenty of funding sources. Paired with a continually increasing number of life sciences graduates from UCSF, UC Berkeley and Stanford, growth appears to be sustainable in the long term, especially as the response to COVID-19 highlights the value of life sciences companies in the

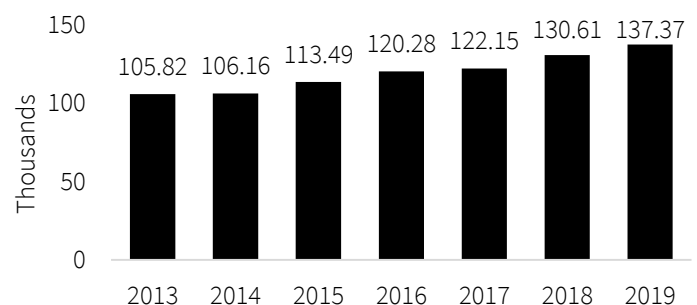
preservation of the health of the overall economy.

As life sciences companies have proven to be extremely resilient, an increasing amount of real estate operators have added life sciences projects as part of their portfolios, such as DRA Advisors and Local Capital Group acquiring Marina Village, and Kilroy Realty moving forward with the Oyster Point project. Interest from Capital Markets is expected to only increase from hereon out as life sciences is proving to be one of the most resilient stores of wealth in the current cycle.

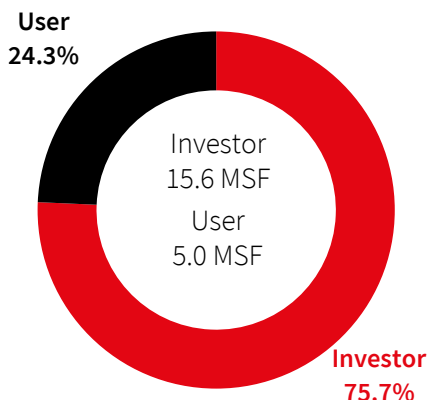
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

		% life sciences to private employment	
Workforce	Total life sciences		Five-year growth
Employment	137,368	4.0%	21.0%
Establishments	3,391	1.3%	25.5%
		% to total U.S.	
Funding	Total life sciences		
VC funding	\$5,536M	29.9%	
NIH funding	\$1,210M	3.9%	
Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (NNN)
	15.57M s.f.	7.3%	\$58.30 p.s.f.

San Francisco Peninsula

North County

Projects mount as demand outpaces supply

- In the past year, the South San Francisco/Brisbane lab cluster has seen strong leasing activity continue from the prior year. Amgen, Janssen and Cytokinetics have signed leases at prominent projects, prompting developers to move further ahead in fleshing out more development proposals.
- As rental rates continued to sustain at high levels in the San Francisco office market, Stripe opted to sign an office lease at Kilroy Oyster Point, contributing to a supply crunch as vacancy hits an all-time low despite numerous project completions.

Central County

Opportunistic conversion plays gather steam

- While successfully stabilizing 2 Tower Place in South San Francisco, Phase 3 pivoted toward converting an office building in San Mateo into lab as a supply imbalance has given rapidly expanding companies little choice but to shift toward North County.
- The clear shortfall in supply has also prompted Alexandria Real Estate to move forward with a proposal of the second phase of its District for Science and Technology, which will nearly double the amount of space available in the market.

South County

Outlook muted as development opportunities remain limited

- Despite the lack of large blocks of space in the South County, the focus of development near city centers has kept prolific lab developers from pursuing ground-up development. This has kept upward pressure on pricing despite the lack of new, highly amenitized product.

Facilities scorecard

Supply	North County	Central County	South County
Rentable lab stock	8.50M s.f.	1.49M s.f.	3.37M s.f.
Owner-occupied lab stock	3.1M s.f.	741K s.f.	0 s.f.
(% of total lab stock)	36.5%	49.7%	0%
Total vacancy	1.9%	1.0%	0.5%
(Change year-over-year)	-1.5 ppts	-1.2 ppts	-1.4 ppts
# of large blocks over 50,000 s.f.	5	1	0
Under construction (s.f.)	2,723,694 s.f.	666,000 s.f.	0 s.f.
Demand			
# of requirements		47	
Total s.f. requirements		3,901,500 s.f.	
Pricing			
Average asking rent (NNN)	\$66.00 p.s.f.	\$66.84 p.s.f.	\$69.00 p.s.f.
(Change year-over-year)	+15.5%	N/A	+16.8%

Recent activity

Smartlabs

2 Tower Place
South San Francisco
80,000 s.f.
New to Market

Phase 3 Real Estate

Bridge Investment Group
1900 Alameda de las Pulgas
San Mateo
89,145 s.f.
\$398 p.s.f.

Gateway of Pacific

750–1000 Gateway Blvd.
South San Francisco
1,216,929 s.f.
Q3 2020 (Phase I)
Q3 2021 (Phase II & III)

115,466 s.f.

111 Oyster Point Blvd.
South San Francisco
Class A
\$5.50 NNN

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

East Bay

Oakland Metro

Consistent demand and VC funding strengthen life sciences

- Life sciences companies continue to flourish in Oakland Metro, specifically in Alameda, Berkeley and Emeryville, where biotech companies are most abundant. While large-user demand is primarily driven by life sciences companies looking to expand within these markets, activity from the Peninsula continues to increase.
- As lab supply stretches thin in Berkeley and Emeryville, attention has recently shifted to Marina Village and Harbor Bay in Alameda, where landlords are offering office-to-lab conversions for companies looking for space. Notable tenants like Penumbra and Exelixis have committed to large expansion plans at Harbor Bay, which include roughly 350,000 square feet of new build-to-suit developments.
- In a market largely controlled by local ownership, interest in East Bay biotech has seen a drastic escalation in the last two years from all ownership types.

Tri-Valley

Lead innovators in Tri-Valley create ideal growth environment

- The Tri-Valley is home to long-standing life sciences companies that continue to serve as anchor tenants in the market. 10X Genomics, Unchained Labs, Lawrence Livermore National Labs and Roche Molecular Systems are among the list of notable life sciences companies. The abundance of innovative companies creates an ideal environment for collaboration and growing startups.
- A steady stream of venture capital funding has further solidified investor confidence in the area. For example, 10X Genomics has raised \$216 million over the last four years; it occupies 200,000 square feet in Pleasanton and continues to keep options open for additional expansion within the market.

Facilities scorecard

Supply	Oakland Metro	Tri-Valley
Rentable lab stock	5.4M s.f.	1.3M s.f.
Owner-occupied lab stock	913K s.f.	466K s.f.
(% of total lab stock)	16.1%	34.0%
Total vacancy	9.5%	1.7%
(Change year-over-year)	-0.4 ppts	+1.9 ppts
# of large blocks over 50,000 s.f.	11	1
Under construction (s.f.)	443,682 s.f.	208,650 s.f.
Demand		
# of requirements	23	2
Total s.f. requirements	646,000 s.f.	210,000 s.f.
Pricing		
Average asking rent (NNN)	\$57.00 p.s.f.	\$24.60 p.s.f.
(Change year-over-year)	+16.3%	-1.6%

Recent activity

Exelixis

1950 Harbor Bay
Alameda
220,000 s.f.
Build-to-suit

PSAI Realty

Gerding Edlen
1650 65th St.
Emeryville
127,000 s.f.
\$399 p.s.f.

Penumbra

1310 Harbor Bay Parkway
Alameda
127,000 s.f.
April 2021
Build-to-Suit

DRA Advisors

Wind River Acquisition
The Research Park at Marina Village
285,000 s.f.
Alameda
Class B
\$4.75 NNN

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

San Francisco Mission Bay

Mission Bay/China Basin

Activity stagnant as office development prioritized

- Office tenants willing to pay office rents at levels much higher than typical lab rents have disincentivized developers from more ground-up lab developments.
- Barring incentives from the City of San Francisco, growing life sciences companies such as VIR Biotechnology will always have to look for lab product in the Peninsula.

Facilities scorecard

Supply	Mission Bay/China Basin
Rentable lab stock	1.1M s.f.
Owner-occupied lab stock (% of total lab stock)	375,079 s.f. 26%
Total vacancy (Change year-over-year)	0% 0 ppts
# of large blocks over 50,000 s.f.	0
Under construction (s.f.)	0 s.f.
Demand	
# of requirements	0
Total s.f. requirements	0 s.f.
Pricing	
Average asking rent (NNN) (Change year-over-year)	\$60–\$70 p.s.f. 0%

Recent activity

Clovis Oncology

1700 Owens St.
San Francisco
24,877 s.f.
Class A
Renewal

Activity key: **Leasing**
Sales
Under construction
Large blocks of space

Seattle-Bellevue

Cluster score
33.4

Key insights

The Lake Union development pipeline continues to expand, with 600,000 square feet currently under construction and 1.6 million square feet in the design phase.

With the Atrium and 1165 Eastlake fully leased, Dexter Yard is now the only new construction space available across Seattle and the Eastside that is equipped to deliver as lab space.

Seattle-Bellevue

The Seattle-Bellevue life sciences market continues to expand at a rapid rate. From 2010 to 2019, employment was up 21 percent across the market, with notable gains in the research and development and pharmaceutical manufacturing sectors. Available space remains the greatest impediment to growth but relief is on the way in the Lake Union submarket. 600,000 square feet is already under development, with an additional 1.6 million square feet in the pipeline.

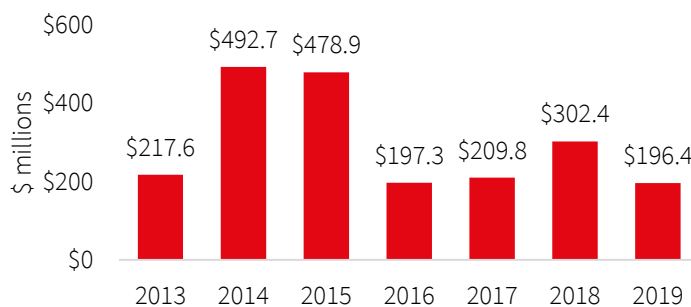
Lake Union

The Lake Union market is home to a majority of the office lab space in the Seattle-Bellevue region and home to companies at the forefront of COVID-19 vaccine and therapeutics development like Gilead and Sana Biotechnology. We expect short-term demand to create a significant supply-demand imbalance. Long-term, we are tracking enough space in the development pipeline to more than double the amount of leasable inventory in the market.

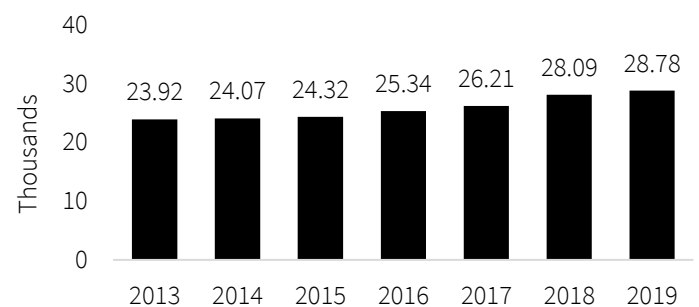
Bothell

Demand greatly outweighs availability in the region's largest flex and R&D lab market. Active requirements are nearly four times the total space actively marketed for availability. Since 2010, pharmaceutical manufacturing and lab testing are up more than 50 percent. With no new space slated for development and a variety of local firms focused on COVID-19 vaccine development and testing, we expect investors to explore conversion opportunities.

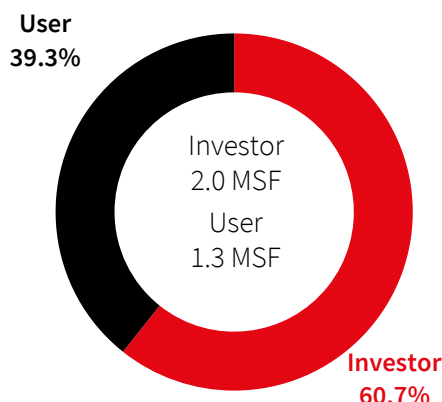
VC funding



Life sciences jobs



Ownership share



Economic indicators overview

		% life sciences to private employment	
Workforce	Total life sciences		Five-year growth
Employment	28,783	1.7%	18.3%
Establishments	1,073	1.0%	11.7%
		% to total U.S.	
Funding	Total life sciences		
VC funding	\$196.4M	1.0%	
NIH funding	\$1,077M	3.5%	
Inventory (Investor-owned)	Total supply	% total vacancy	Average asking rent (NNN)
	2.03M s.f.	8.5%	\$43.14 p.s.f.

Seattle-Bellevue

Lake Union

Development poised to double leasable inventory

- After closing its IPO in July 2019, Adaptive Biotechnologies went on a leasing spree in the Lake Union submarket. After closing a 66,000-square-foot blend and extend at 1551 Eastlake, it preleased the entire 1165 Eastlake new development.
- In spite of multiple rumors about single tech users leasing Dexter Yard, the 500,000-square-foot project is still available. It remains as the only space under development with the capability to deliver lab space in the Seattle region.
- The City of Seattle selected Alexandria Real Estate to develop the Mercer Mega block back in August 2019. The project includes 770,000 square feet of lab space, with an additional 417,000 square feet of space planned on adjacent parcels at 601 and 701 Dexter.

Bothell

Demand greatly exceeds availability

- Seattle Genetics' 61,000-square-foot renewal at Highlands Campus Tech Center represents the largest lease in the Bothell life sciences market over the last year. Thanks to steady revenue increases, a slew of successful drug trials, and FDA approval for its breast cancer treatment drug Tukysa, Seattle Genetics' stock price is up 37 percent year-over-year.
- The 43,000 square feet of available space at Nexus Canyon Park is the largest block of available space in the Bothell life sciences market. With no new development in the pipeline, the conversion of what was previously T-Mobile data center space should provide some much-needed relief for expanding tenants in this space-constrained market.

Facilities scorecard

Supply	Lake Union	Bothell
Rentable lab stock	2.5M s.f.	0.7M s.f.
Owner-occupied lab stock	1.0M s.f.	0.0M s.f.
(% of total lab stock)	28.4%	0.0%
Total vacancy	4.9%	16.5%
(Change year-over-year)	+4.1 pts	-10.7 pts
# of large blocks over 50,000 s.f.	1	1
Under construction (s.f.)	498,842 s.f.	0.0 s.f.
Demand		
# of requirements	5	15
Total s.f. requirements	45,000 s.f.	408,000 s.f.
Pricing		
Average asking rent (NNN)	\$52.00 p.s.f.	\$16.68 p.s.f.
(Change year-over-year)	-10.6%	+13.0%

Recent activity

Adaptive Biotechnologies

1165 Eastlake Ave. E
Seattle
100,084 s.f.
Class A

Seattle Genetics

21520 30th Drive SE
Bothell
61,000 s.f.
Class B

Dexter Yard

700 Dexter Ave. N
Seattle
498,842 s.f.
Class A

Nexus Canyon Park

21720 23rd Drive SE
Bothell
42,132 s.f.
Class B

Activity key: **Leasing**
Sales
Under construction
Large blocks of space



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