JLL | Achieve Ambitions

United States | 2019

JLL Research Report

Life Sciences Outlook

Innovation is alive and well

What's inside?

Innovation, operations & investment

JLL's 2019 U.S. Life Sciences Outlook takes a deep dive into the innovation, operations and investment in the industry and how these trends are shaping the future of the real estate that supports this dynamic sector. Each year, our Cluster Ranking looks at how these trends are shaping the top geographies across the U.S. most actively devoting resources to the life sciences.

In 2019, the top-ranked clusters, Boston and San Francisco, continue to pull away from the pack as the leading life sciences ecosystems. Boston and San Francisco metros compete head-to-head for the top location for venture capital investment in the sector. In fact, these two clusters took more than half of all venture capital dollars in the industry for 2018. These top clusters also top the list for new life sciences development: both have over 3.3 MSF of new lab space under construction.

Despite the high rents and lack of availability, both of these life sciences ecosystems continue to thrive as the top centers of talent and innovation.

That's not to say there haven't been less-established markets making impressive gains. Houston, for instance, has one of the highest five-year growth rates in life sciences establishments at 15.5 percent, trailing Boston and Raleigh-Durham. While the two top clusters struggle with a lack of available lab space, two of the fastest-growing clusters, Denver and Raleigh-Durham, are uniquely positioned to accommodate growth with some of the highest vacancy rates, 14 percent and 16 percent respectively. The life sciences sector is booming in both of these clusters, and they recorded some of the highest employment growth in the sector, each growing over 15 percent in the last five years, trailing only San Francisco.

Each cluster has its own individual success story. The City of New York is leading by example. The City's conscious effort and willingness to invest in the resources to grow its life sciences sector are paying off. Three years after Mayor Bill de Blasio announced a $500M initiative to advance life sciences in the city, New York City is on track to double the size of the city's lab space supply.

While each cluster is unique, boasting different expertise across a variety of subsectors, the common theme that brings them together is having a mixture of world-class academic institutions, top-notch research facilities and a tight-knit medical community. Ultimately these top clusters have the institutions and the talent to attract the investment and NIH funding that now supports these ecosystems, as well as the infrastructure necessary to succeed.

U.S. cluster rankings

Rank	Cluster	Weighted score
1	Greater Boston Area	89.2
2	San Francisco Bay Area	81.6
3	San Diego Metro Area	71.6
4	Raleigh-Durham Metro Area	64.3
5	Suburban Maryland/Metro DC	52.5
6	Seattle Metro Area	49.9
7	New Jersey	48.2
8	Philadelphia Metro Area	47.2
9	Chicago Metro Area	43.5
10	Los Angeles/Orange County	41.1
11	Denver Metro Area	38.8
12	Houston	35.7
13	New York City	34.1
14	Minneapolis–St. Paul Metro Area	30.8
15	Westchester County	27.4
16	Long Island	23.7

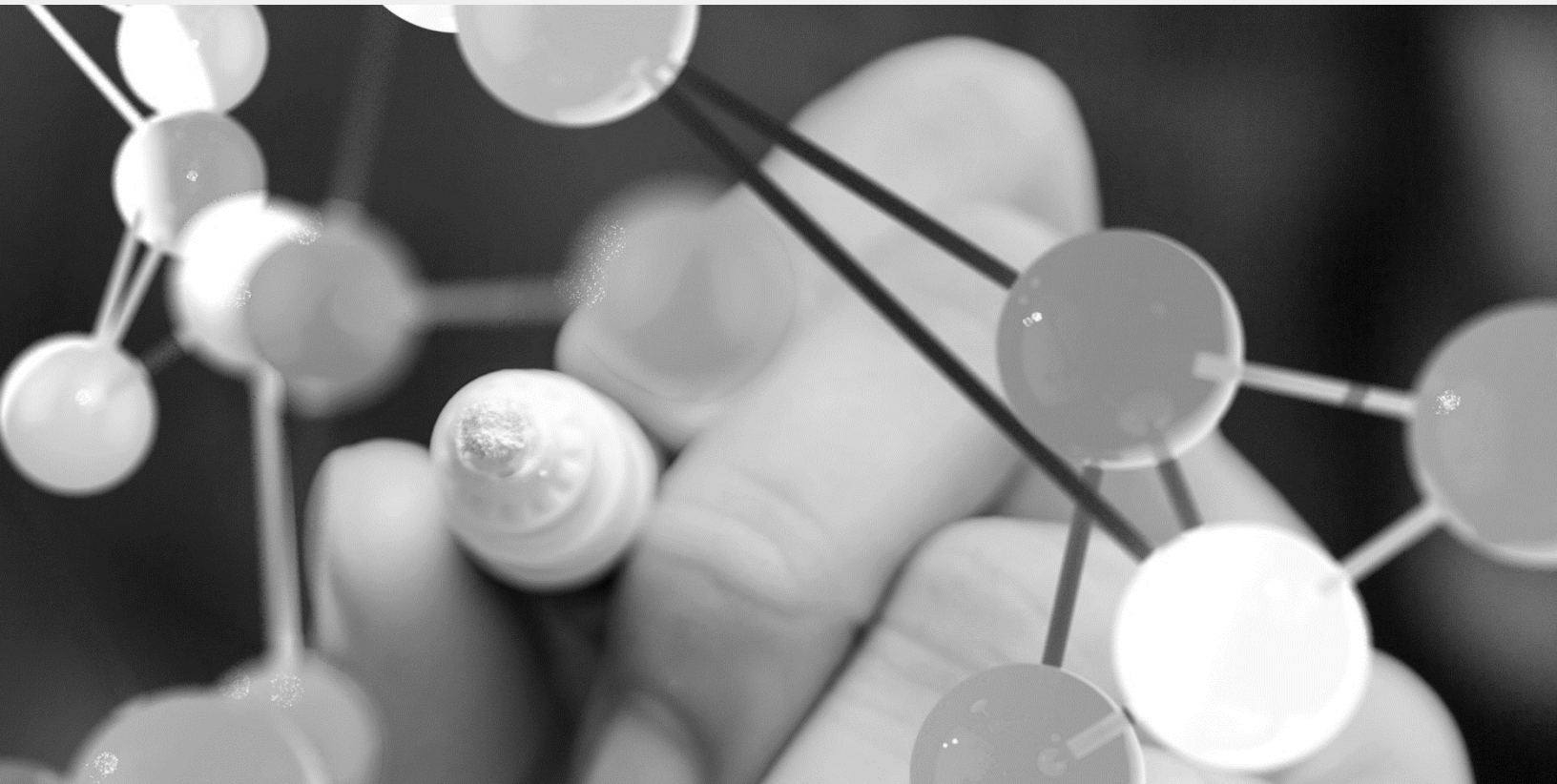
Life sciences employment concentration:
Weight: 20.0%
Measured as the percent of industry employment against total metro private employment. (BLS, 2017)
Life sciences venture capital funding:
Weight: 15.0%
Funding from 2018 (Crunchbase)
Total lab supply:
Weight: 15.0%
Life sciences employment growth:
Weight: 10.0%
Life sciences establishments concentration:
Weight: 10.0%
Measured as the percent of industry establishments against total metro private establishments. (BLS, 2017)
Life sciences National Institutes of Health funding:
Weight: 10.0 %
National Institutes of Health, 2018
Market occupancy rate:
Weight: 10.0%
Average asking rent (NNN):
Weight: 10.0%

The U.S. life sciences landscape in 2019

The pace of change in life sciences is faster than ever.

While trends in the industry generally take place over decades rather than years, many of the foundational elements to shift from treatment to wellness, for example, are beginning to take shape.

The life sciences industry continues to fuel breakthrough discoveries that are having a profound impact around the globe. In addition to improving health, securing a more sustainable food supply and promoting cleaner energy, the life sciences sector has become a key economic driver. The life sciences are an increasingly critical part of the national and global economy, and their use of real estate is growing in kind.



State of the market

Trend 1

The promise of new therapeutics: Breakthrough science is driving demand for real estate.

The progress today is revolutionizing how diseases are treated, saving patients' lives and improving quality of life and public health across a broad range of chronic and rare conditions. In this new era of medicine, many diseases previously regarded as deadly are now manageable and even curable.

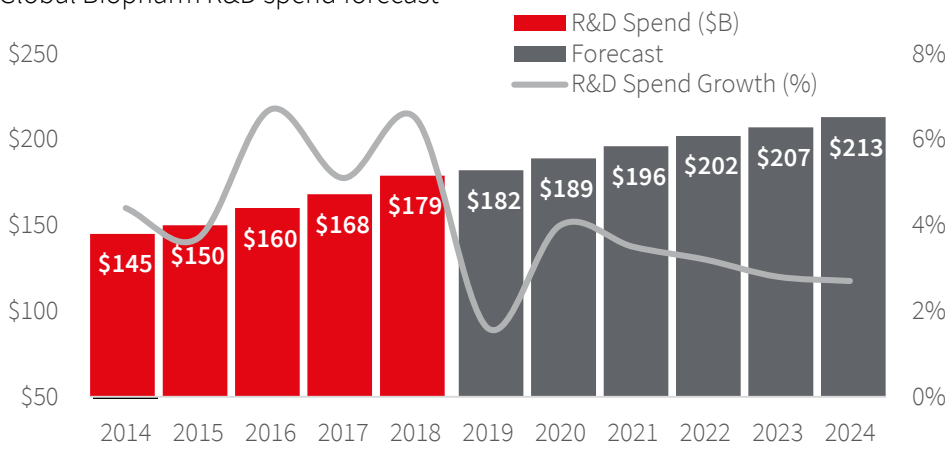
> With over 7,000 medicines in clinical development worldwide, the exciting new wave of medical innovation will play a key role in transforming healthcare and patients' lives.

Robust investment in research and development (R&D) by biopharmaceutical companies has resulted in advances and discoveries unlike anything seen before.

> In the last decade, over $213 billion has been invested in R&D. These investments are just beginning to pay off, opening the door to entirely new ways to tackle some of the most complex and difficult-to-treat diseases of our time.

R&D spending reached a record $179B in 2018 and is expected to grow by $34B by 2024

Global Biopharm R&D spend forecast



Source: EvaluatePharma, 2019

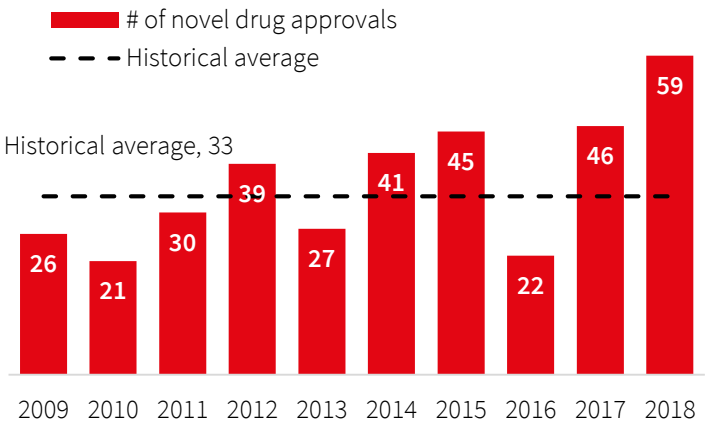
Going forward, R&D spending is forecast to grow at 3.0 percent between 2018 and 2024, an indication that companies are investing now to improve their future pipelines. Use of real-world data combined with machine learning techniques, in addition to collaborative R&D programs, are a few of the initiatives being employed by companies to help them stay one step ahead in an era demanding more patient-targeted drug development.

> Helping to maximize innovation, the FDA is evolving regulatory frameworks to create efficiency and collaboration between industry and regulators.

The development of innovative medicines has evolved dramatically over the past decade. As advances in science, technology and data gradually find application within clinical development, the length of time trials take to complete, the resources required due to trial complexity, and the likelihood of trial success are all shifting, with impacts varying by therapy area. Ongoing changes in the clinical development process have led to a record number of drug approvals. Over the course of 2018, the FDA approved 59 novel drugs that range from the treatment of various cancers, chronic obstructive pulmonary disease (COPD), traveler's diarrhea, migraine headaches and more.

> In addition to a record number of 59 novel drugs approvals in 2018, FDA approvals have been above the long-term average four out of the last five years.

FDA novel drug approvals reach record high



Source: Federal Drug Administration

The 2018 record number of approvals reflects the FDA's efforts to get new drugs to market more quickly and efficiently—helping to keep the momentum of innovation in the life sciences industry.

Key areas of innovation

Oncology
The worldwide market for cancer drugs is estimated at $133 billion and is expected to reach $200 billion by 2022, averaging 10–13 percent growth over the next five years. According to the IQVIA Institute for Human Data Science, the U.S. market alone will reach $100 billion by 2022, averaging 12–15 percent growth. By some estimates, 30 percent of the revenue growth in the pharma industry will come from oncology, and nine of the top 20 products in 2024 will be oncology products.

Immuno-oncology
GlobalData estimates that the total immuno-oncology market will be worth approximately $14 billion in 2019 and $34 billion by 2024. Checkpoint inhibitors will drive the growth, growing from $10 billion in 2019 to $24 billion by 2024. Per IQVIA, the pipeline of immunotherapies is particularly active and includes almost 300 molecules with 60 separate mechanisms being evaluated in Phase I or Phase II clinical trials, which is a significant jump from the four mechanisms in Phase III trials or under regulatory review. These immunotherapy trials are being conducted across 34 different tumor types, indicating the broad-based application of this new approach to cancer treatment.

Gene Therapy
Per Allied Market Research, the global gene therapy market was valued at $584 million in 2016 and is estimated to reach $4.402 billion by 2023. Manufacturers are also preparing for growth in this market. In a flurry of M&A activity, manufacturers are expanding their gene therapy capabilities due to the potential of these treatments to drive the next major leg of industry growth.

State of the market

Trend 2

Life sciences companies are raising more money at a faster pace than ever before. From venture capital to IPOs and M&A, investment in life sciences is at all-time highs.

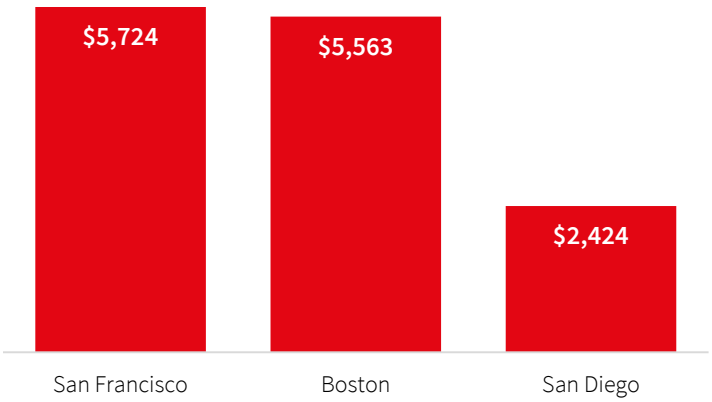
New innovation is attracting more capital to life sciences than ever before.

Venture capital hits record levels

Overall, venture capital funding going to the life sciences industry has surged, growing over 40 percent in the U.S. alone in the past year, driving employment growth and new construction. In addition, venture capital funding rounds have increased substantially in the last decade. For example, an average of Series C round has grown 375 percent since 2010 to an average of $75.2 million.

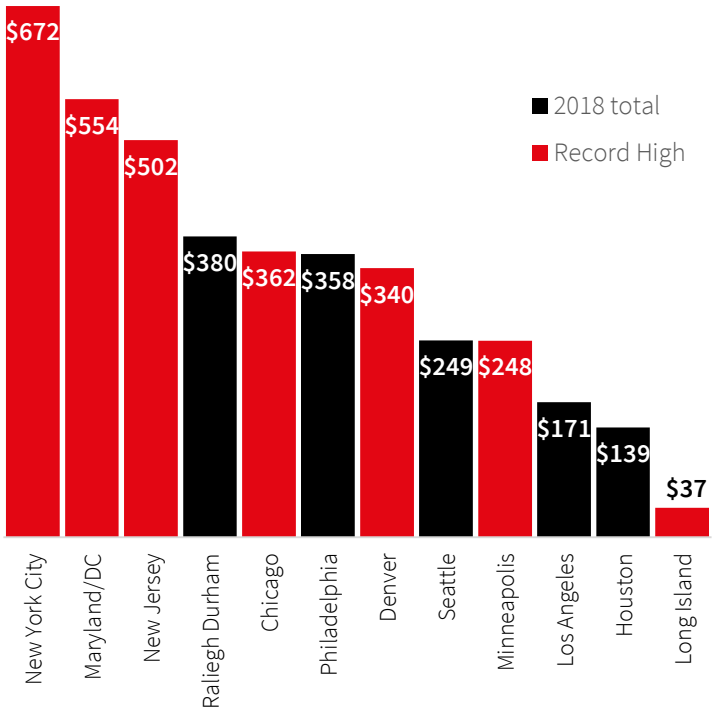
> The three top clusters raised record amounts of venture capital in 2018. San Francisco narrowly edged out Boston for the highest amount.

2018 Venture Capital Top Three Life Sciences Clusters
($ millions)



In 2018, 10 of the 16 clusters achieved all-time highs in venture capital investment, combining to raise $17.7 billion. However, digging deeper, 80 percent of that total was distributed to only three clusters: San Francisco, Boston and San Diego. This infusion of cash and investment allows these markets to grow at a rate unlike any other clusters in the country and has created insatiable demand for lab space.

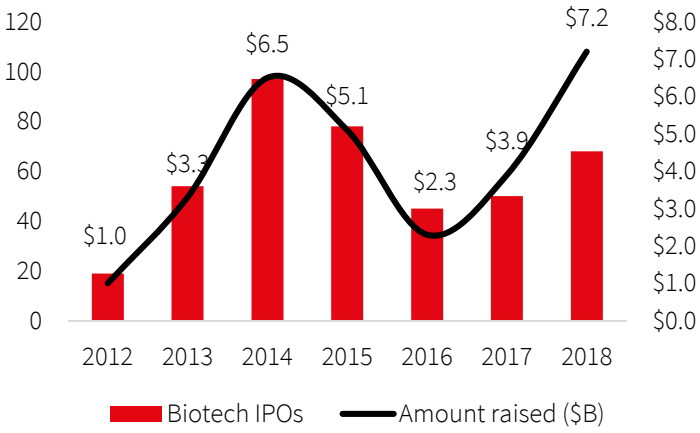
2018 Venture Capital by Life Science Cluster ($ millions)



Sources: JLL Research, Crunchbase

2018 also saw a resurgence in the number of new biotech initial public offerings (IPOs), with 68 IPOs on U.S. stock exchanges, up 35 percent from 2017. In number, 2018 biotech IPOs were below the previous highs in 2014 and 2015. But there was a substantial increase in the average amount raised per biotech, growing from $51 million in 2012 to $105 million in 2018. Additionally, the number of $100 million IPOs increased from two in 2012 to 31 in 2018—the previous high of 18 was set in 2014.

Biotech capital raised via IPO in 2018 was more than 2016 and 2017 combined



Source: EvaluatePharma

> The impact of this investment can be felt across the drug development landscape. In fact, in the last five years, the total number of drugs in development increased 46 percent according to the 2019 Pharmaprojects Annual Review.

Deal-making and M&A

Industry giants are looking for ways to reach farther out on the edge of innovation. Almost every major industry player was involved in at least one merger or acquisition over the past five years. That trend is expected to continue, if not accelerate, over the next five years, as companies attempt to broaden product lines and take advantage of growth opportunities in emerging markets.

Life sciences mergers and acquisitions (M&A) activity totaled $198 billion in 2018, as life sciences companies focused on building therapeutic scale and optimizing their portfolios according to the 2019 EY M&A Firepower Report.

> Over the last 10 years, the top 10 pharma companies spent an average of 35 percent on M&A from their total R&D investment.

A new era of deal-making is accelerating among biopharmaceutical and genomics companies looking for a leadership position in next-generation therapies. This activity is likely to continue to be a strategic focus for many companies that may face patent expiries, competitive headwinds, weak pipelines and growing technology needs. In fact, large-scale, transformative acquisitions defined 2018 and the beginning of 2019, such as Bristol-Myers Squibb's $74 billion acquisition of Celgene and Takeda's $62 billion acquisition of Shire Pharmaceuticals.

> Since 2012, 31 biotech companies have been acquired with valuations exceeding $1 billion each, according to Silicon Valley Bank's Trends in Healthcare Investments and Exits 2019.

The growth in venture capital, IPOs and M&A activity reflects the investment community's excitement about buying into the therapeutic innovation: new modalities unlocking potential cures, new products based on transformational biology, platforms that can produce multiple first- or best-in-class programs—all with an expectation of these new medicines having a significant impact on patients and with the prospect of an enormous upside.

The boom in funding has also increased competition and furthered the talent war between companies. Despite skyrocketing rents in the top clusters, the cost of real estate comes second to finding talent.

State of the market

Trend 3

Talent is mission critical for growth but clusters face specific workforce challenges.

In 2018, the life sciences sector was an economic driver:

2.1 million jobs | **82,300** companies

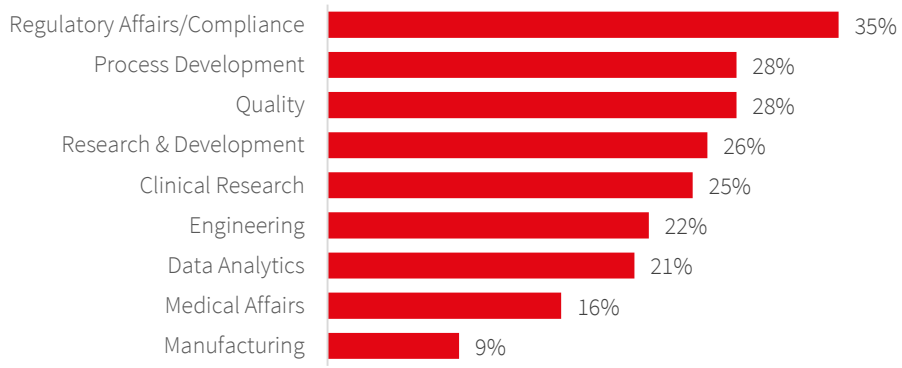
Source: Bureau of Labor Statistics

To fuel this innovation, access to a life sciences ecosystem and the ability to hire across functional areas remains a key driver for growth.

> Life sciences industry wages are higher and growing faster, on average, than those for the overall economy. Median wage for life sciences occupations according to the Bureau of Labor Statistics in 2018 was over 70 percent higher than the national average of all other occupations.

Hiring top life sciences talent is challenging, as companies are finding that access to a pool of skilled workers across functional areas is equally critical to growth. While technical expertise remains important, employers also seek people who can navigate these complex external and internal changes while driving innovative product development and commercialization. According to the Coalition of State Bioscience Institutes' (CSBI) 2018 Workforce Trends Report, demand for soft skills has risen to the top as the ability to navigate in this dynamic and competitive industry has become critical.

Hiring managers report that positions outside of R&D talent are often the most challenging positions in the industry to fill

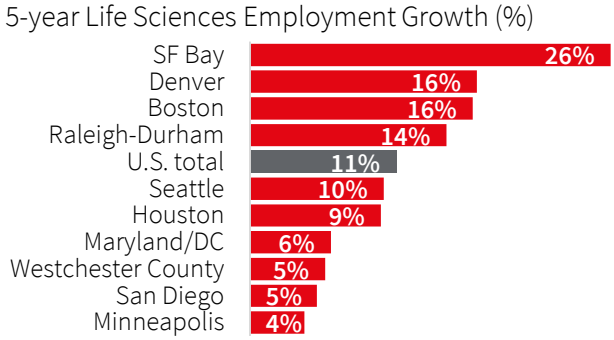


Source: Coalition of State Bioscience Institutes (CSBI), Hiring Manager Survey

New and varied challenges have also emerged in each life sciences cluster as companies search for talent

> The San Francisco Bay Area's life sciences employment has grown by over 25 percent since 2013, more than double job growth across the U.S. In fact, four of the top clusters' employment growth in this industry has outpaced overall growth in the last five years.

Fastest growing Life Sciences clusters far outpace the U.S. job growth



Source: BLS

The top clusters face unique challenges

The largest clusters, the San Francisco Bay Area and Boston, benefit from their thriving ecosystems. But while these regions are unlikely to lose their prominence as global leaders in life sciences innovation, they struggle with infrastructure and affordability challenges, making it difficult to recruit and retain talent and for recent graduates from these regions' excellent universities to remain in the area. In addition, the growth of tech companies and increasing overlap of the tech and life sciences industries create additional and unique challenges in these clusters. Life sciences companies increasingly are competing with tech companies who offer rich benefit packages and rapid product development cycles with attractive resume-building opportunities. This can make it difficult for life sciences companies to recruit talent in some of these new technology roles.

Growing life sciences clusters get creative

Emerging clusters with premiere universities and teaching hospitals, such as Philadelphia and New York City, have seen a growth spurt in life sciences because they offer large talent pools, but companies in less-established clusters can face a scarcity of local talent to enable them to build or expand. Most report seeking qualified, experienced job candidates from other states or from abroad. Soon these clusters will become ecosystems that will allow for more robust talent marketplaces to flourish. In the interim, several emerging clusters have thriving industry associations, such as Denver's Colorado BioScience Association or Seattle's Life Science Washington, that provide training and advocacy, facilitate industry-academic advancement and promote industry job opportunities.

Life sciences clusters in close proximity share a deeper talent pool

Taking a broader view of where to find talent, we looked at clusters that are regionally situated as the best spots to access the graduates coming out of the top life sciences programs in the country.

Life Sciences graduates within a 60-mile radius of cluster center

Life sciences cluster	Life sciences graduates	Life sciences cluster	Life sciences graduates
New Jersey	10,540	San Francisco	4,271
Westchester	8,786	Chicago	3,458
Long Island	8,479	San Diego	2,684
New York City	8,364	Raleigh-Durham	2,460
Los Angeles	7,430	Minneapolis	2,266
Philadelphia	5,645	Denver	2,168
Boston	5,583	Seattle	1,769
Suburban MD	4,453	Houston	1,543

Not only does the New York, Northern New Jersey, Long Island metropolitan statistical area (MSA) stand out as a regional cluster that shares many of the top institutions for life sciences graduates, this MSA also has one of the nation's highest retention rates for college graduates at 71.1 percent, according to research by the Brookings Institution's Metropolitan Policy Program.

Savvy developers tap growing talent pools

It takes years, even decades, to build a life sciences ecosystem, but experienced lab developers have begun to tap in to highly educated talent pools outside of the top three markets. Alexandria Real Estate Equities (ARE) has developments under construction in Seattle and Maryland, Longfellow Real Estate Partners is partnering with Brandywine on Schuylkill Yards in Philadelphia, and King Street Properties has its Court Square project in Long Island City. All four of these markets have a strong talent pool that has yet to be fully tapped into with regard to life sciences.

State of the market

Trend 4

The clusters are clustering: With availability tightening, each cluster finds a unique real estate solution.

The life sciences clusters are thriving across the U.S. and getting stronger.

The top issue facing tenants today in most markets is finding lab space to perform research. In markets such as San Diego or Boston, developers to this point haven't been able to build new space or convert office properties quickly enough. Even with over 3.3 MSF of new construction under way in both San Francisco and Boston, there is no end in sight.

Four of the top five markets have lab vacancy levels that are half that of traditional office levels

Office vacancy

Boston **13%**	Boston **6%**
San Francisco **7%**	San Francisco **4%**
San Diego **12%**	San Diego **7%**
Washington, DC **17%**	Washington, DC **5%**

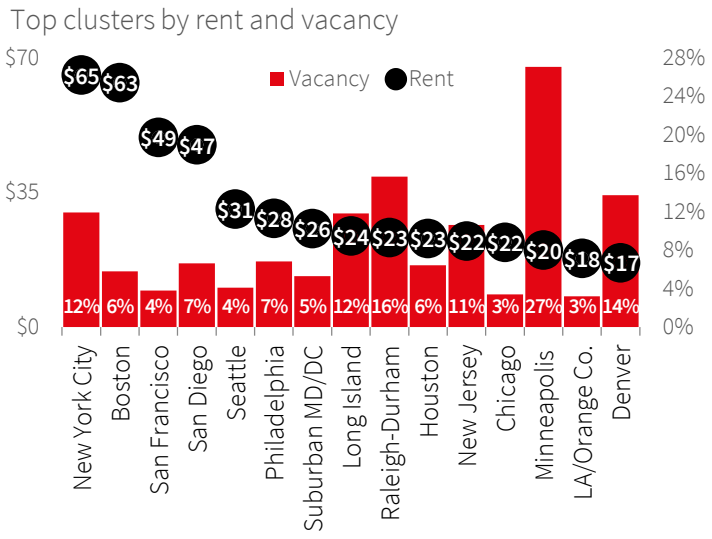
Lab vacancy

Source: JLL Research

This problem of finding space for growth in top clusters is getting more difficult and will continue in the near term as investment flowing into this industry remains at record highs, allowing companies to scale at a breakneck pace. Further, in hot tech markets such as San Francisco, lab tenants often compete with fast-growing tech companies for the same scarce space.

With average vacancy across the U.S. life sciences clusters hovering at 9 percent and below 2 percent in the tightest submarkets, rents are reaching breathless heights. In the Mid-Peninsula area of San Francisco, since 2014 rents have nearly doubled from $32 NNN per square foot to $58 NNN per square foot, while vacancy has remained below 6 percent over that entire time. Most lab submarkets in Greater Boston have seen double-digit rent growth, year-over-year, for consecutive years. In 2018 alone, lab rents increased across Greater Boston by 26 percent in a 24 million-square-foot market. In the incredibly tight industry epicenter of Kendall Square, rents crossed the $100 NNN-per-square-foot mark.

With vacancy rates near record lows across the top clusters, rents are reaching new highs



Source: JLL Research

The increased strength of the top clusters can be attributed to the special ecosystem that needs to exist for a cluster to form. Key elements of the life sciences ecosystem include the knowledgeable developer who has experience building suitable lab space, the investor network that has a proper level of understanding for the science and most importantly the steady pipeline of research talent from nearby top universities.

New real estate concepts create opportunities for the life sciences clusters to thrive

Demand for highly sophisticated lab space and cutting-edge pharmaceutical production facilities has exploded with the expansion of life sciences research and development. The high prices and low vacancies in the top clusters creates opportunities for real estate strategy to become more innovative and provide a critical path for growing companies.

The advent of personalized medicine has spawned a subset of life sciences industry incubators and early-stage companies focused on developing and manufacturing "small batch" pharmaceuticals, adding pressure to the demand for lab space within or nearby life sciences clusters. The specific requirements of building labs make the process more complex than with traditional office space, but in the life sciences clusters across the U.S., it is proving worth it.

Emerging cluster spotlight

Philadelphia

Philadelphia expands the coworking concept to life sciences. Life sciences companies start small like any other industry, but the need for expensive equipment, better lab space and investor support pushes them into traditional space sooner. That is where coworking labs come in.

The coworking concept is proving to be a good fit for the high-stakes world of life sciences research. Rising real estate costs compounded by a dearth of available lab space has spurred the rise of coworking and shared lab spaces across the country in an industry where a collaborative environment is proving to be a key to success.

In an ambitious plan to create the largest coworking ecosystem for healthcare, life sciences and technology-enabled companies in the country, MLP Ventures recently announced it will embark on the first Discovery Labs in the Philadelphia suburb of King of Prussia. The $500 million project is planned for a 1.6 million-square-foot campus and, at full buildout, the complex will include 12 connected buildings ranging from 50,000 to 125,000 square feet.

The Discovery Labs is 20 times larger than the average coworking space and provides the critical infrastructure needed to operate life sciences companies. Discovery Labs is also targeting other markets across the U.S. and has several international locations in its plans as well.

Top cluster spotlight

Raleigh-Durham

In Raleigh-Durham, real estate provides a forum for specialized areas of innovation to thrive. In 2018, global venture capital funding for the agricultural technology (agtech) industry jumped more than 40 percent to nearly $17 billion. To capture demand from this rising niche of agtech companies, in April 2019, Alexandria Real Estate Equities opened the Alexandria Center for AgTech in the heart of the Research Triangle, the country's first and only integrated multitenant agtech R&D and greenhouse campus in the U.S.

This specialized cluster includes two new proprietary platforms, Alexandria LaunchLabs–AgTech and its complementary agtech-focused Alexandria Seed Capital platform. The platforms provide turnkey laboratory, office and greenhouse space, entrepreneurial support, programming and access to capital aimed at fostering the next generation of leading agtech companies to enable better nutrition and human health. Phase 1 of this strategic agtech initiative, a 175,000-square-foot redevelopment, opened fully leased in mid-2019. In addition, construction is under way for the campus's second phase, a 160,000-square-foot office/laboratory and greenhouse space with expected delivery in 2020.

Breakout cluster spotlight

Seattle

In Seattle, life sciences goes head-to-head with technology for real estate. Developments in the life sciences clusters are increasingly leasing speculative lab projects to office users in pursuit of the same talent pool as would-be lab tenants. So potential life sciences tenants are often competing with tech firms that have no other space options but to take pricier, lab-capable product to remain close to the desired talent pipeline.

As a result, lab-capable projects have become popular. These projects are designed with larger floor plates and higher ceilings to handle potential lab tenants and their utility requirements. The costlier lab buildouts are not incurred until a lease with a life sciences tenant has been signed.

In Seattle, Lake Union is the center of the life sciences market, but it is also a booming hub for the tech industry. In 2018, BioMed Realty broke ground on Dexter Yard, a 515,000-square-foot project designed as both a tech office and life sciences laboratory and office space. While this development could provide some relief to biotech and life sciences companies searching the city for lab space, the new project also sits in Amazon's Seattle headquarters' backyard. As a result, this lab-capable development is being marketed to both life sciences and tech companies. Dexter Yard will open in late 2020.

For many life sciences companies, losing this battle for space is often a function of growing too quickly to wait for new projects to be developed and not being large enough a tenant to kick off a development.

Looking forward

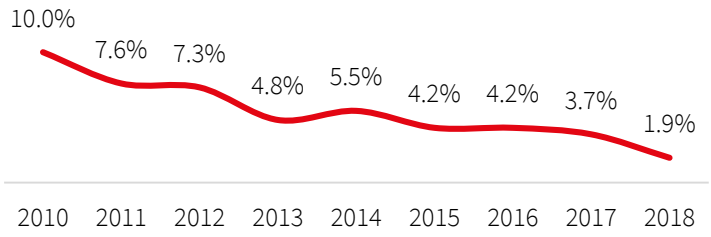
In 2019, the life sciences industry will continue to move beyond the hypothetical and into a new reality.

But there are challenges ahead. The scrutiny over drug pricing will continue to make headlines, and 2019 will undoubtedly be one of the biggest years for policy efforts to reduce drug prices and out-of-pocket expenses for patients.

Meanwhile, for big pharma, returns for R&D continue to decline. In 2018, R&D among 12 large-cap biopharma companies fell to 1.9 percent—down from 10.0 percent in 2010.

R&D returns have fallen to their lowest level in nine years

R&D results for large-cap biopharma companies



Source: Deloitte

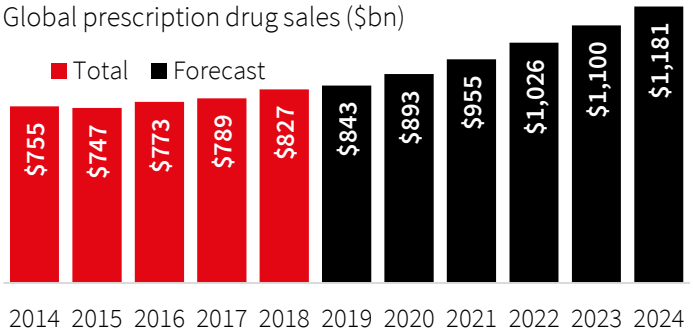
At the same time, the cost to bring a new drug therapy to market increased to record levels in 2018, growing from $1.2 billion in 2010 to nearly $2.2 billion in 2018.

In response, life sciences companies will continue to focus on efficiency and a future that is grounded in digital, data and personalization. The increasing convergence of tech and science will provide new opportunities for the industry, such as the use of real-world evidence to measure the performance of drugs post-approval and drive future investment decisions. Machine learning techniques are being employed to speed up not only drug discovery but also drug development with the hope that data-driven approaches will help reduce R&D costs and industry failure rates.

Despite uncertainty and turmoil beyond the sector, the life sciences industries are expected to be more resilient than many other industries due to the new possibilities emerging every day as the life sciences industry creates novel approaches to healthcare and new areas of innovation. With such technological advances that could offer hope of real cures and the growing demand from emerging economies, worldwide prescription drug sales are expected to rise from $900 billion in 2019 to $1.2 trillion by 2024. The United States alone holds over 45 percent of the global pharmaceutical market.

Pharmaceutical sales are predicted to grow 45 percent in the next five years

Global prescription drug sales ($bn)



Source: EvaluatePharma, 2019

Perhaps most encouraging for the future of the lab real estate supporting this industry is the increasing market share that startups have been occupying. The growing number of small companies is making an impact on the life sciences clusters across the U.S. and, considering that the majority of life sciences space in many cities is owner-occupied, these growing companies are opening up more opportunities for real estate to move into new territory. The life sciences sector has had a positive impact on patients, investors and the economy. This strong performance historically, coupled with the expected rise in prescription drug sales and a continually increasing demand for healthcare innovations, provides a good reason for optimism for the future.

Local *submarket clusters*

> In an era of rapidly evolving and advancing trends, the life sciences industry is paving the way for a new future for healthcare.

Greater Boston

Greater Boston is the global epicenter of life sciences research. Investors have taken notice of record rents, as lab development has reached an all-time high throughout 2018 and the beginning of 2019.

Finding lab space remains the number one challenge and top priority for tenants. Developers have not been able to keep pace with lab demand, which has driven up market rents dramatically.

Cambridge

New Class A asking rents in Kendall Square have topped $100 NNN per square foot for the first time ever, while asking rents in West Cambridge notched above $70 NNN, which is also an all-time high. Cambridge tenant demand remains robust at nearly 3 million square feet as of Q2 2019, for a market with less than 1 percent vacancy.

Core Suburbs

Watertown, Waltham, Lexington and Bedford continue to dominate suburban lab leasing and development activity. Over the last five years over 1.6 million square feet of tenants have migrated outside of East Cambridge due to space constraints, most of which have landed in this market. One huge suburban trend of 2018 and 2019 has been office-to-lab building conversions. There is over 600,000 square feet of conversion projects either under way or proposed in this market.

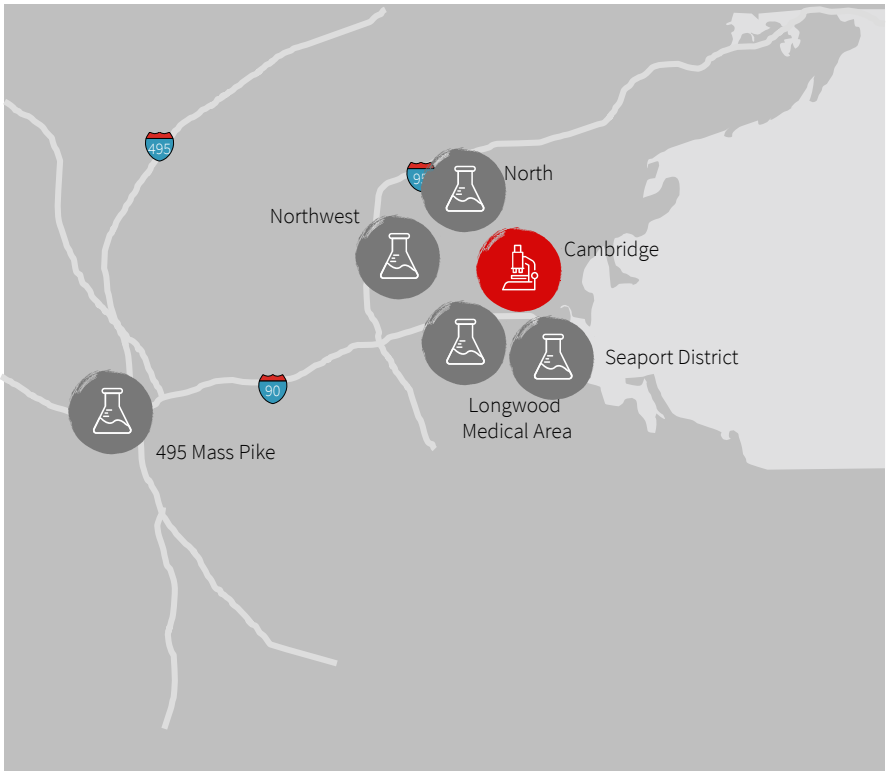
Seaport District

The Seaport is arguably one of the hottest new urban lab clusters. Developers and investors have lined up and are dropping huge sums to purchase land and build lab space. The market is currently only about 1.7 million square feet, but the proposed development pipeline of about 3 million square feet could make the Seaport the second-biggest lab cluster behind Kendall Square within a few years.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 89.2

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	95,209	4.7%	5.1%
Establishments	2,273	1.7%	3.5%

Funding	Total life sciences	% to total U.S.
VC funding	$5,562M	27.7%
NIH funding	$2,438M	8.7%

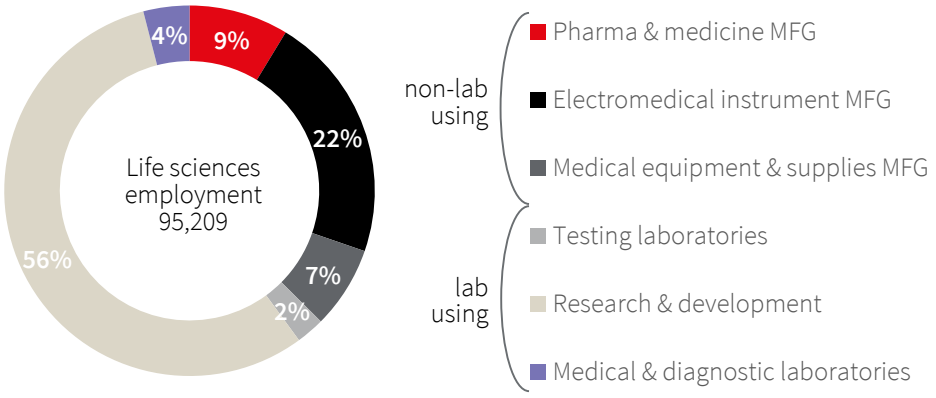
Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	23.9M s.f.	5.8%	$63.44 p.s.f.

Greater Boston recorded the largest five-year employment growth out of any top life sciences cluster in the United States. Life sciences job growth has outpaced overall job growth at a pace of nearly 4 to 1 last year. Research and development jobs continue to be the main driver, increasing by over 9 percent year-over-year for the second consecutive year. Despite the tight labor market, the local ecosystem of world-class universities and hospitals provides a steady pipeline of research scientists for the local life sciences market to continue its robust growth.

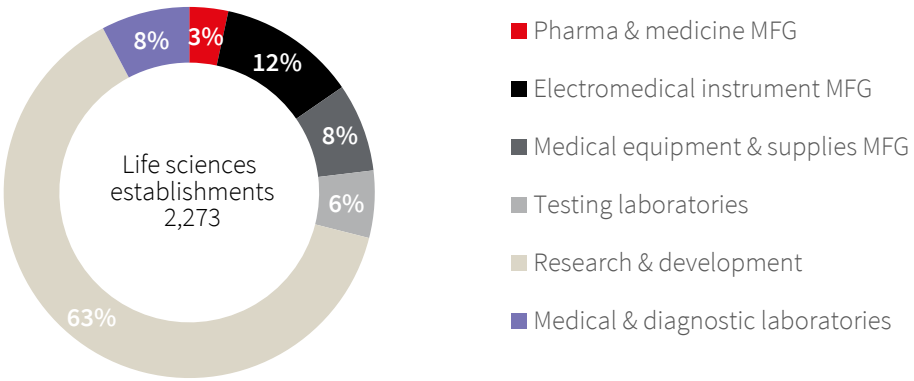
VC funding in 2018 smashed the record for total funding set in the previous year by over $2 billion, as Greater Boston life sciences companies captured more than 1 in 4 dollars invested in the United States. The largest funding round for 2018 in the U.S. was Cambridge-based Moderna Therapeutics, which raised $500 million during a Series G round in February 2018. Additionally, 15 life sciences organizations tapped into the public markets and went public in 2018.

Boston once again led the way in NIH funding, receiving over $2 billion in grants from the federal government, which at 8.7 percent was the highest share of any market. There were 10 institutions that each received over $100 million, displaying the diversity this market has in hospitals, medical centers and research institutions.

Life sciences employment composition



Life sciences establishment composition



Cambridge

Facilities scorecard

Supply	East Cambridge	West Cambridge
Rentable lab stock	8.3 m.s.f.	990,000 s.f.
Owner-occupied lab stock	3.9 m.s.f.	0 s.f.
(% of total lab stock)	34.7%	4.1%
Total vacancy	0.4%	2.8%
(Change year-over-year)	-2.0 ppts	-5.7 ppts
# of large blocks over 50,000 s.f.	3	1
Under construction (s.f.)	1,472,000 s.f.	270,000 s.f.
Demand		
# of requirements	20	5
Total s.f. requirements	1,478,500 s.f.	125,000 s.f.
Pricing		
Average asking rent (NNN)	$91.72 p.s.f.	$67.86 p.s.f.
(Change year-over-year)	+11.3%	+7.5%

Recent activity

Sanofi-Genzyme
Cambridge Crossing
900,000 s.f.
Class A
New Lease

Takeda
35/40 Landsdowne St.
417,061 s.f.
Class A
Renewal

75–125 Binney St.
Cambridge
B: Clarion Partners
S: Alexandria Real Estate
388,270 s.f.
$1,880/s.f.

238 Main St.
MIT
386,600 s.f.
$101 NNN

Activity key: **Leasing** **Sales** **Under construction**

East Cambridge

New construction asking rents top $100 NNN

- Asking rents at MIT's new Kendall Square development have topped $100 NNN per square foot. The 386,000-square-foot building is already 80 percent committed, illustrating companies' appetite to pay record rents for a premier location.
- Space in East Cambridge remains a scarcity with only 0.04 percent vacancy. Developers have tried to respond to a space crunch and now 18 percent of total supply is under construction. However, over 50 percent of the pipeline is already committed, despite the lion's share not delivering until 2021.

West Cambridge

Alewife area continues to flourish

- The Bulfinch Companies kicked off a 250,000-square-foot speculative lab in the second half of 2018, and all but one floor is already committed.
- The Davis Companies wrapped up a 225,000-square-foot speculative lab development, leasing the entire building among five different tenants upon completion.
- These two projects signal the demand for speculative development outside of East Cambridge, once considered too risky. Now it is essentially a must to develop on spec to tap into tenant demands that often require less than 12 months' timing for new space.

Core Suburbs

Facilities scorecard

Supply	Core Suburbs
Rentable lab stock	4.3 m.s.f.
Owner-occupied lab stock	2.2 m.s.f.
(% of total lab stock)	17.8%
Total vacancy	10.9%
(Change year-over-year)	-0.1 ppts
# of large blocks over 50,000 s.f.	5
Under construction (s.f.)	853,064 s.f.
Demand	
# of requirements	29
Total s.f. requirements	1,397,500 s.f.
Pricing	
Average asking rent (NNN)	$53.44 p.s.f.
(Change year-over-year)	+12.7%

Recent activity

Elevate Bio
The Post
Waltham
107,008 s.f.
Class A
New Lease

Alkermes
900 Winter St.
Waltham
220,000 s.f.
Class A
New Lease

The Linx
490 Arsenal St.
Watertown
B: Clarion Partners
S: Boylston Properties
185,000 s.f.
$930/s.f.

Hayden Research Campus
75 Hayden Ave.
Lexington
213,000 s.f.
$63 NNN

Activity key: **Leasing** **Sales** **Under construction**

Core Suburbs

Suburban development picks up the pace

- With a supply crunch undertaking Cambridge and Boston, developers have picked up the pace with five notable speculative projects. In Waltham, The Post and 828 Winter St. both completed in 2018, while 225 Wyman just kicked off in June. The Post locked in ElevateBio and Dicephera, as well as another office/flex-using tenant. In Lexington, suburban lab developer King Street Properties kicked off an expansion of its Hayden Research Campus with 213,000 square feet of spec lab delivering in 2021. And finally, Boylston Properties is targeting late 2019 for completion of its first of two lab buildings at the mixed-use Arsenal Yards project, which is half leased to SQZ Bio and has a $70 NNN-per-square-foot asking rent on the remaining portion.
- Another trend undertaking the suburbs is office-to-lab conversion. Owners with significant vacancies have been evaluating whether their properties are ripe for a conversion. With lab rents oftentimes at a $20–$30 premium to office rents in the same market, landlords are trying to cash in with a conversion. In Waltham, Boston Properties is converting both 195 and 200 West St., while BioMed Realty is converting 65 Grove St. in white-hot Watertown. Finally, the Gutierrez Company is converting the 110,000-square-foot vacant Four Burlington Woods and rebranding as the Burlington BioCenter.

The Seaport

Facilities scorecard

Supply	The Seaport
Rentable lab stock	1.9 m.s.f.
Owner-occupied lab stock	0.0 m.s.f.
(% of total lab stock)	7.9%
Total vacancy	5.3%
(Change year-over-year)	+2.3 ppts
# of large blocks over 50,000 s.f.	2
Under construction (s.f.)	400,000 s.f.
Demand	
# of requirements	12
Total s.f. requirements	985,500 s.f.
Pricing	
Average asking rent (NNN)	$66.15 p.s.f.
(Change year-over-year)	+16.2%

Recent activity

Akouos
645 Summer St.
Boston
37,500 s.f.
Class B
New lease

Ginkgo Bioworks
27 Drydock Ave.
Boston
189,636 s.f.
Class B
Expansion

Puretech Health
6 Tide St.
Boston
50,858 s.f.
Class A
New Lease

ISQ Phase II
316 Northern Ave.
Boston
Related Beal
250,000 s.f.

Activity key: **Leasing** **Sales** **Under construction**

Seaport District

Seaport poised to break out as second-largest lab cluster in MA

- Developers shelled out hundreds of millions of dollars on future Seaport lab sites throughout 2018 and the beginning of 2019.
- Related Beal dropped $218 million for a 6.5-acre future mixed-use site that could accommodate more than 1 million square feet of office, multifamily and lab. This was just weeks after a joint venture between Alexandria and National Development spent $252 million on GE's new headquarters, which includes a fully permitted site for a 300,000-square-foot lab site. Additionally, Alexandria and National Development purchased the adjacent garage for $81 million. All three sites sit on no more than 12 acres, creating the potential for a mini lab cluster to form within a five-minute walk to New England's busiest transit stop, South Station.
- Further southwest on the A Street corridor, Tishman Speyer announced plans for a 245,000-square-foot speculative lab building that will replace the existing flex/warehouse building. Across the street from that, Alexandria and Anchor Line Partners teamed up on the purchase and development of 99 A St., which is situated just steps away from the Broadway Red Line stop, giving it direct access to Kendall Square.
- These proposed projects have the ability to more than double today's lab inventory in the Seaport, creating a new dense cluster unseen anywhere besides Kendall Square. With most of the proposed projects in the early to mid stages of planning, delivery timing remains hazy at best. However, there seems to be a clear consensus among developers and investors that the Seaport is positioned to become not only a relief valve for East Cambridge tenants but another true viable urban lab market option.

Chicago

While the north suburban corridor of Chicago has an established life sciences cluster, the region has further opportunity to grow and is in need of new, high-quality laboratory space.

Chicago has a very healthy diversification of industries, and the life sciences employ over 85,000 people and contribute more than $98 billion (12 percent of GDP) in annual statewide economic output (iBIO).*

The majority of life sciences companies in the Chicago region are concentrated in the North Cook and North Lake County submarkets. In addition, within the city, the Illinois Medical District is a rising hub for investment near the UIC campus.

While Chicago's life sciences employment ranks second in the U.S. behind the New York region, plenty of opportunity still exists to broaden its exposure. For every life sciences job created, an additional 3.5 jobs are supported throughout the broader economy, and for every $1 of biomedical research, local business activity increases by $2.43. As the need for newer space becomes more prevalent in the local economy, a number of different life sciences parks are proposed and new developers are beginning to take a more targeted look at the industry.

With an established pharmaceutical industry in place, yet facing a shortage of high-quality space across the market, Chicago offers significant opportunity for investors who can identify the right location for new development. As a couple of projects are just recently breaking ground, one potential large project could be the Discovery Partners Institute, which has been proposed for an expansive site south of Chicago's Loop, known as The 78.

Despite a defining regional trend of urban corporate migrations, the life sciences industry has been slower to make this move, and the DPI project could serve as a catalyst.

Along with many owner-occupied multinational companies, the federal government maintains a biotech presence in Chicago as well. Argonne National Lab in suburban Woodridge and Fermi National Lab in Batavia both employ thousands. The 24-acre Illinois Science & Tech Park in Skokie, which was developed specifically to accommodate demand from biotech users, is fully leased to occupants such as Charles River and Vetter Pharma, and will be adding 134,000 square feet of space.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing

*Illinois Biotechnology Innovation Organization (iBIO)

Economic Scorecard

Cluster score: 43.5

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	50,931	1.7%	-3.3%
Establishments	1,321	0.7%	-8.9%

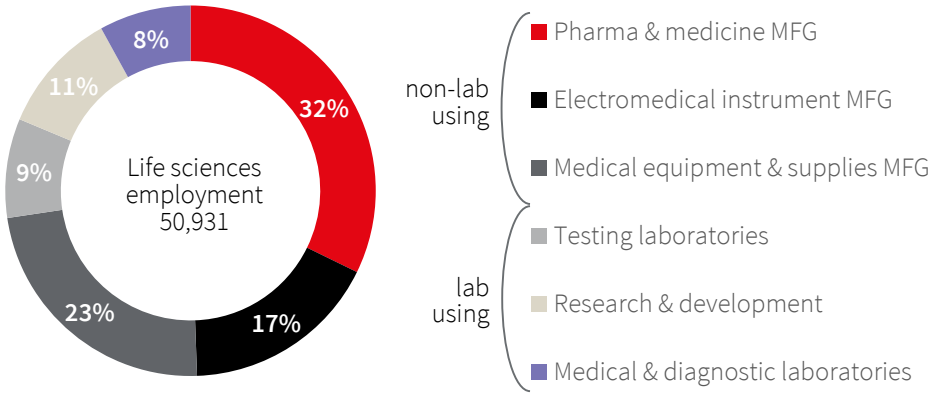
Funding	Total life sciences	% to total U.S.
VC funding	$361.5M	1.8%
NIH funding	$784.4M	2.8%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	13.9 m.s.f.	3.4%	$22.00 p.s.f.

Chicagoland is one of the most highly concentrated area for hospitals, with seven large providers and then dozens of smaller healthcare facilities across the suburbs. Chicago also boasts one of the widest and most diverse educational systems of any market—with University of Chicago, Northwestern, University of Illinois in Chicago and DePaul, to name just a few.

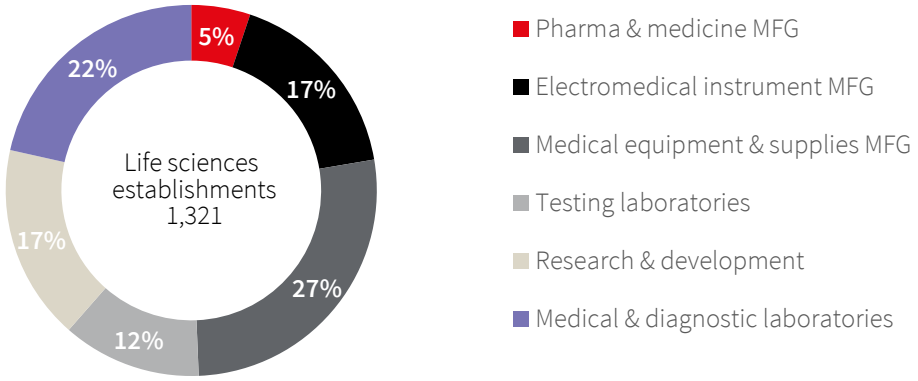
In Chicago's life sciences sector, publicly traded multinational corporations have traditionally dominated. Just in this past cycle, Abbott Labs, Baxtor International and Horizon Pharma all expanded their U.S./North American operations in Chicago. New biotech companies entered the market as well—Vetter constructed a brand-new $320M production facility adding 300 jobs; Valent opened a new $27M, 85,000-square-foot research center as well.

Life sciences employment composition



Chicago's multiple full-service hospitals, research institutions and educational pipeline make it a market ripe for a surge in life sciences activity, similar to what has happened with the tech sector in recent years. Though there is a decent footprint of it in the market now, a shortage of high-quality lab space is becoming apparent as most of the existing space in the northern suburbs is fully occupied.

Life sciences establishment composition



North Shore

Facilities scorecard

Supply	North Cook	North Lake
Rentable lab stock	925,000 s.f.	4.56 m.s.f.
Owner-occupied lab stock	1.0 m.s.f.	4.2 m.s.f.
Total vacancy	8.2%	1.7%
(Change year-over-year)	-7.6 ppts	-0.33 ppts
# of large blocks over 50,000 s.f.	0	2
Under construction (s.f.)	130,000 s.f.	100,000 s.f.
Demand		
# of requirements	4	7
Total s.f. requirements	95,000 s.f.	400,000 s.f.
Pricing		
Average asking rent (NNN)	$15.00 p.s.f.	$15.00 p.s.f.
(Change year-over-year)	+1.0%	+1.5%

Recent activity

Vetter's Future HQ
Mt. Prospect & Algonquin Road
Mundelein
1,200,000 s.f.
Class A
Built-to-suit

Planmeca USA HQ
2600 Forbs Ave.
Hoffman Estates
90,000 s.f.
Class A

Illinois Science & Tech Park
4901 Searle Parkway
Skokie
130,000 s.f.
Class A
Built-to-suit

Rosalind Franklin Research Park
3333 Green Bay Road
North Chicago
100,000 s.f.
Class A

Activity key: **Leasing** **Sales** **Under construction**

North Cook & Northwest

Illinois Science & Tech Park fully leased, expanding

- Pharma Logistics broke ground in early June on a new 130,000-square-foot facility that is expected to deliver in early 2020.
- Planmeca, a leading manufacturer of dental equipment, purchased 2600 Forbs Ave., where it will relocate and expand its headquarters from 77,000 s.f. to 90,000 s.f. later this year.
- Vetter Pharma International USA and Charles River Laboratories International both extended and expanded at the Illinois Science & Tech Park in Skokie. The expansion by both longtime tenants leaves the existing three-building facility 100 percent leased, with developer American Landmark Properties now focusing on a second phase—redeveloping a 140,000-square-foot office space for new tenants.

North Lake

North Lake lab developments becoming available

- 909 E. Orchard, in the northern suburb of Mundelein, has available lab space, which was recently sold and redeveloped.
- Rosalind Franklin Medical School recently broke ground on a 100,000-square-foot redevelopment, where the low-profile medical school will occupy two-thirds of it and lease the rest to another tenant, plus the addition of an incubator.
- Northwestern Medical added 1.2 m.s.f. of medical research space over the past five years, with a portion of that dedicated to life sciences industry collaboration.

Downtown Chicago

Facilities scorecard

Supply	North Chicago	Illinois Med Dist.
Rentable lab stock	250,000 s.f.	303,000 s.f.
Owner-occupied lab stock	104,000 s.f.	2.5 m.s.f.
Total vacancy	0.0%	6.6%
(Change year-over-year)	0 ppts	0 ppts
# of large blocks over 50,000 s.f.	1	0
Under construction (s.f.)	119,415 s.f.	580,000 s.f.
Demand		
# of requirements	1	2
Total s.f. requirements	50,000 s.f.	100,000 s.f.
Pricing		
Average asking rent (NNN)	$23.15 p.s.f.	$21.00 p.s.f.
(Change year-over-year)	+2.0%	+2.8%

Recent activity

Sterling Bay–Stanley Mann Research Institute
2430 N. Halsted
Chicago
119,415 s.f.
Class A

Rush University Medical Center
Ashland & Harrison St.
Chicago
530,000 s.f.
Class A

Illinois Medical District
1969 W. Ogden Ave.
Chicago
50,000 s.f.
Class A

Lincoln Yards
Chicago
Undisclosed s.f.
Class A
Sterling Bay to use unspecified amount of Lincoln Yards office space for life sciences

Activity key: **Leasing** **Sales** **Under construction**

Lincoln Park

Sterling Bay committed to life sciences space moving forward

- Chicago Developer Sterling Bay, which was just approved for the $6 billion Lincoln Yards megadevelopment, is using its influence on the Lincoln Park area for the life sciences industry. CEO Andy Gloor claims that there is a shortage of high-quality lab space in Chicago and will focus on filling some of the Lincoln Yards space with life sciences.
- The inspiration behind the Prysm venture is to mimic something similar to what 1871, a tech incubator in Merchandise Mart who seemingly began a snowball-effect of tech migration, did for that industry in Chicago.
- Lincoln Yards will include several research facilities to allow small to large institutions to flourish, serving their immediate and growing needs.

Illinois Medical District

IMD targeting new quality lab space for area's needed facelift

- A litany of news projects in the Illinois Medical District area will bring a much needed facelift to the older area by developing several new life sciences buildings, as well as bolster the already well-established hospitals.
- The 560-acre area on Chicago's Near West Side is nearly one-third covered by an opportunity zone, or a tax-incentivized area for developers, and will bring a new influx of investment in short order.
- One of those projects already in the planning phase is a 530,000-square-foot, $500 million outpatient care facility at Rush Hospital.
- The long-vacant Cook County Hospital in undergoing a renovation, set to open back up in 2020, and will bring two hotels with it, but also an unannounced portion of medical office space.

Denver

With college graduates at 42.4 percent and high school graduates at 90.9 percent, Colorado has one of the nation's most highly educated labor forces. A consistent, high flow of in-migration has boosted the recruitable workforce.

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 startup companies.

Boulder/Northwest

The Boulder and Northwest submarket cluster comprises 69.7 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. The majority of tenant requirements in this area are small, falling in the 5,000- to 15,000-square-foot range.

SE/Southeast Suburban

The Southeast and Southeast Suburban submarkets are home to 11.4 percent of Denver's lab space. Although these submarkets are not the most active within the life sciences industry, the area is home to the Fitzsimons Life Science District and Anschutz Medical Campus—considered to be the epicenter of Colorado's growing bioscience community. Here, many startups benefit from shared creative and incubator space while in growth mode.

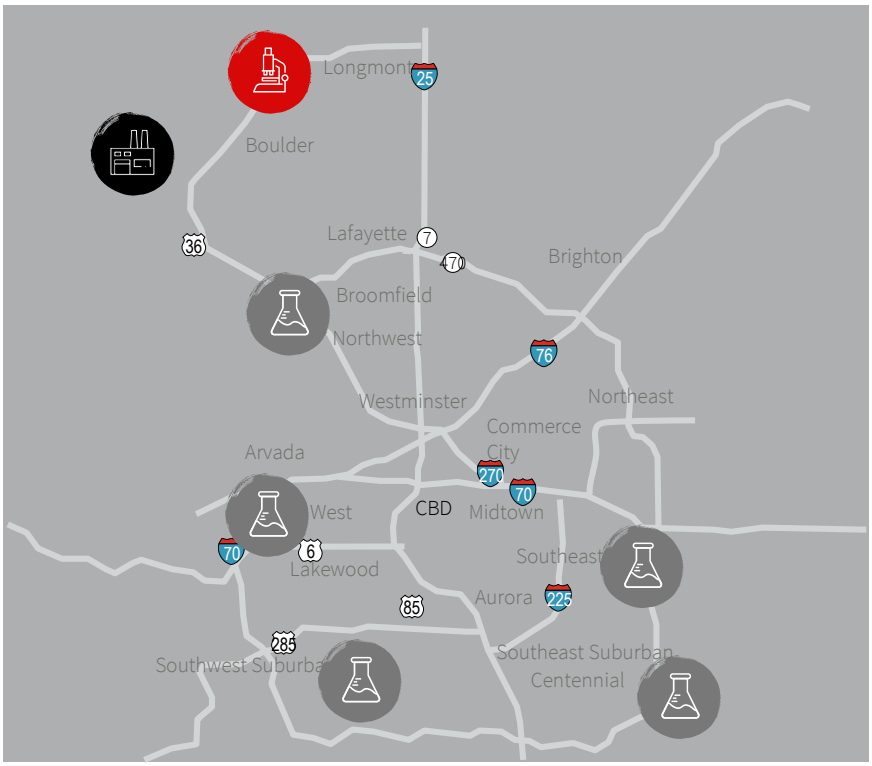
West Suburbs/Southwest Suburban

The West and Southwest Suburban submarkets encompass 18.9 percent of the market's lab space. Within these submarkets, space tends to be both second-generation lab space and flex/office-to-lab conversion product. Tenant requirements in these submarkets are smaller in size, typically ranging from 2,500 to 10,000 square feet.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 38.8

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	28,092	2.0%	0.3%
Establishments	1,170	1.0%	-5.0%

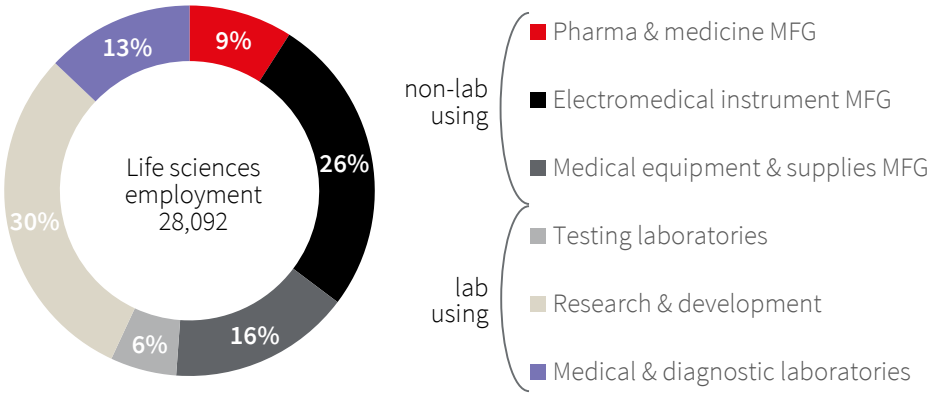
Funding	Total life sciences	% to total U.S.
VC funding	$340.4M	1.7%
NIH funding	$399.2M	1.7%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	5.83 m.s.f.	13.7%	$16.62 p.s.f.

Users and real estate professionals alike often compare the search for appropriate lab space in Denver to "finding a needle in a haystack." Existing, in-place 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. Oftentimes, smaller users must opt to share lab space.

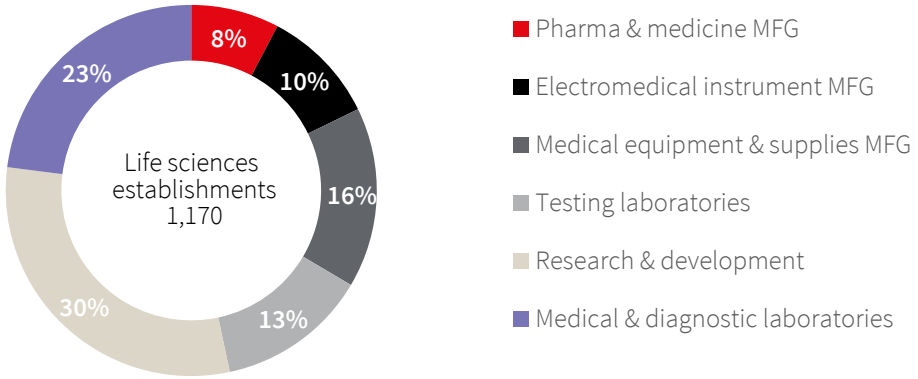
Across the board, nearly all sectors of the life sciences industry are growing in Denver. This is most notable in the pharmaceuticals sector, which has experienced employment contraction in two of the past five years. The sheer amount of time and capital required to turn a profit, coupled with a challenging regulatory environment, have been factors in regional companies choosing to consolidate.

Life sciences employment composition



Incubators and startups tend to thrive in Colorado, but lack of space and funding often pushes these companies out once they become established. Growth, access to capital and reinvestment for life sciences companies in Colorado still pales in comparison to coastal states. Oftentimes, these more established markets siphon not only funding but companies and talent as well from Colorado.

Life sciences establishment composition



Boulder/Northwest

Facilities scorecard

Supply	Boulder	Northwest
Rentable lab stock	1.8 m.s.f.	1.4 m.s.f.
Owner-occupied lab stock	0.7 m.s.f.	89,000 s.f.
(% of total lab stock)	37.5%	6.2%
Total vacancy	21.2%	6.3%
(Change year-over-year)	-0.8 ppts	-4.3 ppts
# of large blocks over 50,000 s.f.	1	0
Under construction (s.f.)	0 s.f.	0 s.f.
Demand		
# of requirements	3	13
Total s.f. requirements	30,000 s.f.	580,000 s.f.
Pricing		
Average asking rent (NNN)	$15.03 p.s.f.	$13.96 p.s.f.
(Change year-over-year)	-12.0%	+11.6%

Recent activity

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

Dropworks
2560 55th St.
Boulder
7,118 s.f.
Class B

AstraZeneca Campus
4000 Nelson Road
Longmont
692,000 s.f.
Class B

Thermo Fisher Scientific
2650 Crescent Drive
Lafayette
8,642 s.f.
Class B

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

Mini market

Influx of user activity rushes in over the last six months

- 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.
- Through 2018, 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.
- In 2018, the cluster recorded -4,051 square feet of negative absorption but has experienced positive 21,493 square feet of net absorption year-to-date 2019.
- During the last 12 months, this market has tightened further, with vacancy rates trending downward and settling at 14.7 percent, 310 basis points lower than one year ago. Available options for users seeking lab space are believed to be notably tighter than the recorded vacancy rate figure.
- 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.
- In April, AstraZeneca suddenly sold its Longmont campus for $30.0 million to a subsidiary of Novartis. It is believed that this could cause a ripple effect and bring more biotech activity to the region.
- AstraZeneca's 180,000-square-foot Boulder facility has experienced high interest and is rumored to be under contract with a biotech company.
- The cluster's largest available block, The Max's 461,330-square-foot space, is receiving interest from several users.
- Landlord-favorable conditions remain in the cluster, with no change expected through the remainder of the year.

SE/Southeast Suburban

Facilities scorecard

Supply	SE	Southeast Suburban
Rentable lab stock	0.2 m.s.f.	0.4 m.s.f.
Owner-occupied lab stock	89,000 s.f.	34,000 s.f.
(% of total lab stock)	35.2%	7.9%
Total vacancy	2.4%	26.5%
(Change year-over-year)	+2.4 ppts	+9.0 ppts
# of large blocks over 50,000 s.f.	0	0
Under construction (s.f.)	117,000 s.f.	0 s.f.
Demand		
# of requirements	3	2
Total s.f. requirements	33,000 s.f.	30,000 s.f.
Pricing		
Average asking rent (NNN)	$22.00 p.s.f.	$10.56 p.s.f.
(Change year-over-year)	+22.2%	+1.8%

Recent activity

Bioscience 3
2115 N. Scranton Way
Aurora
117,000 s.f.
Class A

Highland Tech Center, Bldg. 3
8985 E. Nichols Ave.
Englewood
16,689 s.f.
Class C

Highland Tech Center, Bldg. 2
8955 E. Nichols Ave.
Englewood
27,711 s.f.
Class C

Highland Tech Center, Bldg. 1
8925 E. Nichols Ave.
Englewood
16,689 s.f.
Class C

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

Mini market

Anchoring CO's life sciences cluster with Fitzsimons Campus

- Located at 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.
- Home to the University of Colorado Hospital, the University of Colorado Denver's Health Science Schools and Children's Hospital.
- 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.
- The SE and Southeast Suburban submarkets combined for positive 1,400 square feet of net absorption during 2018 and -61,587 square feet of negative net absorption during year-to-date 2019, leading to vacancy increasing 750 basis points to 18.5 percent.
- Rental rates in the submarkets are currently at $22.00 and $10.56 per square foot NNN—marking upward movement in both the SE and Southeast Suburban submarkets.
- Historically, tenants have held the upper hand in negotiations here, expected to remain the case in the foreseeable future.
- Typical users include startups occupying shared, creative and incubator space throughout their growth-mode phase.
- As more VC funding finds its way into the vicinity during the second half of the year, expect an increase in like-kind occupiers to seek space as near to Fitzsimmons and Anschutz as operating budgets will allow.
- One building—Bioscience 3—is under construction for 117,000 square feet at Fitzsimons. The building is expected to deliver in Q4 2019 and is 36.9 percent leased.
- The district will continue to put Denver on the map of U.S. top markets for life sciences in the years ahead.

West/Southwest Suburban

Facilities scorecard

Supply	West Suburbs	Southwest Suburban
Rentable lab stock	0.7 m.s.f.	0.2 m.s.f.
Owner-occupied lab stock	0.2 m.s.f.	0.0 s.f.
(% of total lab stock)	26.5%	0.0%
Total vacancy	5.0%	18.6%
(Change year-over-year)	-4.1 ppts	+6.3 ppts
# of large blocks over 50,000 s.f.	0	0
Under construction (s.f.)	0 s.f.	0 s.f.
Demand		
# of requirements	2	2
Total s.f. requirements	20,000 s.f.	20,000 s.f.
Pricing		
Average asking rent (NNN)	$12.10 p.s.f.	$12.20 p.s.f.
(Change year-over-year)	-1.8%	+11.4%

Recent activity

CME America
14998 W. Sixth Ave.
Golden
18,297 s.f.
Class B

Coors Technology Center
4653 Table Mountain Drive
Golden
53,656 s.f.
Class B

Ken Caryl Business Center
11149 Bradford Road
Littleton
36,847 s.f.
Class B

2750 W. Mansfield Ave.
2750 W. Mansfield Ave.
Sheridan
10,080 s.f.
Class B

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

Mini market

Submarket cluster vacancy down despite tenant move-outs

- The West and Southwest Suburban submarkets are largely aligned within the Jefferson County boundaries.
- Long considered a leading area for bioscience with renowned research institutions and global companies, JeffCo boasts Colorado's second-highest concentration of medical device manufacturers at 29.5 percent.
- It is home to the Colorado School of Mines, where pioneering research is being conducted in the field of nano medicine and biofuel.
- Located in Golden, National Bioenergy Center serves as the nation's central point of contact for bioenergy and bio-products with its state-of-the-art lab facilities spread across multiple federal agencies.
- Space tends to be both second-generation lab space and flex/office-to-lab conversion space, and as momentum has picked up over the last year the West Suburbs are on the cusp of containing major lab supply.
- The cluster recorded -40,163 square feet of negative net absorption in 2018, but positive 25,565 square feet of net absorption year-to-date 2019.
- Vacancy in the cluster is down 130 basis points year-over-year and sits at 8.5 percent currently.
- Rental rates are currently $12.10 NNN per square foot in the West Suburbs, reflecting a 1.8 percent decrease from the previous year. Despite strong growth, the submarket offers one of the lowest rates in the market.
- Rental rates are currently $12.20 NNN per square foot in the Southwest Suburbs, up 11.4 percent from the previous year due to additional space coming online.
- Given the historically elevated vacancy rate in this cluster, the life sciences market pendulum has rested mostly with tenants for the past several years, but is tending to swing toward landlords as more space is absorbed.

Houston

Texas Medical Center redesigns TMC³ collaborative campus to drive further biotechnology and bioscience innovation.

Texas A&M's EnMed program to be nation's first fully integrated engineering medicine dual degree, beginning summer 2019.

Texas Medical Center

Houston is home to the world's largest medical complex, the Texas Medical Center (TMC), the epicenter for healthcare, life sciences, research and education. With 50 million square feet of developed space and an annual GDP of $25 billion, TMC is the eighth-largest business district in the U.S. At the life sciences forefront is TMC's Innovation Institute, an incubator ecosystem for startup companies. It is this concentration of expertise and investment that is advancing Houston as an emerging life sciences cluster.

TMC³

TMC³'s moniker is such because the Texas Medical Center endeavors to make Houston the "third coast" for life sciences research. While TMC's 61 member institutions are siloed to an extent, the new TMC³ biomedical research hub will bring the collective community together on a 30-acre campus. Construction on the first collaboration building is projected to kick off in 2020, with completion as early as 2022. TMC³'s fundamental goal is to advance human health from conceptual research to tangible solutions, all within the city of Houston.

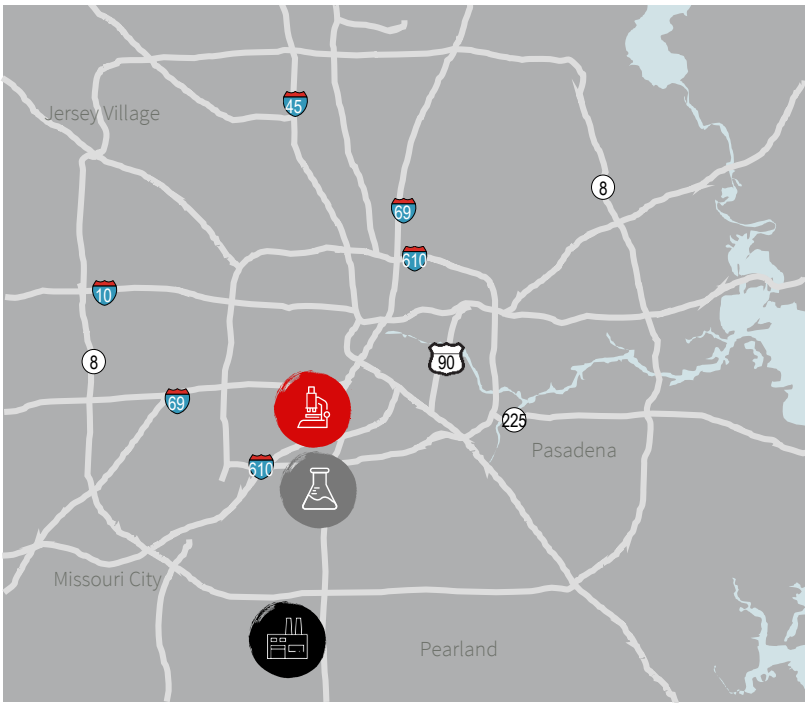
Texas A&M EnMed

Houston's healthcare educational offerings are diverse—from colleges of medicine, nursing and pharmacy, to even a high school for life sciences. A joint project of Texas A&M University and Houston Methodist Hospital will take life sciences education to the next level. An engineering and medicine program, or EnMed for short, will provide students with both an MD and an MS in engineering. Texas A&M is seeking to empower researchers and practitioners to solve the most complex healthcare challenges.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 35.7

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	31,233	1.2%	3.5%
Establishments	1,457	0.9%	3.8%

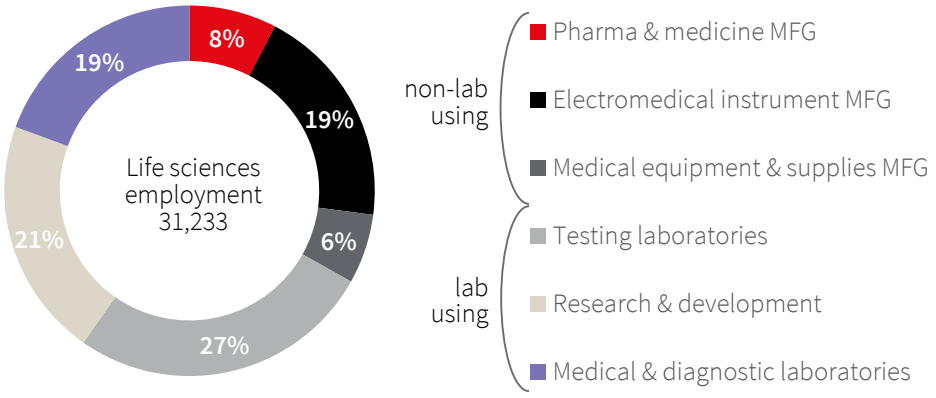
Funding	Total life sciences	% to total U.S.
VC funding	$138.9M	0.7%
NIH funding	$733.9M	2.6%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	5.6 m.s.f.	6.4%	$23.00 p.s.f.

Houston's VC funding varies widely from year to year, depending on stages of projects in the pipeline. The largest announcements in 2018 included OncoResponse for $40 million and ViraCyte for $30 million. These projects drove VC funding to more than double the 2017 total, reaching $138.9 million raised. NIH funding has consistently trended upward in recent years, hitting $731.4 million in 2018. Baylor College of Medicine and the University of Texas System continue to be the largest benefactors, receiving over 90 percent of Houston's NIH awards.

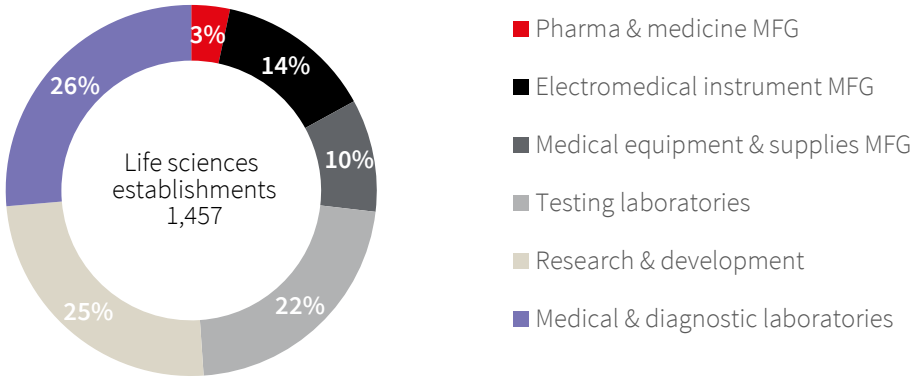
Healthcare is projected to be the leading sector for job growth in the Houston Metro for 2019. In the life sciences subset, both workforce employment and number of establishments grew markedly in 2018. The metro experienced a second consecutive year of above-3 percent growth, which far exceeds total private employment numbers. Testing laboratories and research and development are the largest life sciences occupation industries.

Life sciences employment composition



The number of life sciences establishments in Houston totaled 1,457 in 2017, growing almost 30 percent in the last decade. Notable area employers include LivaNova USA, Philips, Bayer, Lexicon, Bellicum and Novartis. In fact, LivaNova is considering a new, large-scale innovation campus in Southeast Houston. The project is expected to include office and lab space for research, development and testing.

Life sciences establishment composition



Houston

Facilities scorecard

Supply	TMC	Near Southwest
Rentable lab stock	1.5 m.s.f.	585,000 s.f.
Owner-occupied lab stock	3.5 m.s.f.	34,000 s.f.
(% of total lab stock)	89.0%	11.0%
Total vacancy	4.5%	11.2%
(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.	0 s.f.
Demand		
# of requirements	3	1
Total s.f. requirements	25,000 s.f.	8,000 s.f.
Pricing		
Average asking rent (NNN)	$24.50 p.s.f.	$19.60 p.s.f.
(Change year-over-year)	+0.0%	+0.0%

Recent activity

Environmental Chemistry
2525 W. Bellfort St.
Near SW
16,089 s.f.
Flex

Undisclosed
7707 Fannin Drive
TMC
7,628 s.f.
Class B

Main Link Biotechnology Park
10301 Stella Link
Near SW
42,120 s.f.
Class B

2575 W. Bellfort St.
Near SW
20,892 s.f.
Class B

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

TMC

Groundwork laid for further industry advancement

- TMC Innovation Institute has raised $230 million in total funding to date. Incubator programs include TMCx, TMCx+, TMC Biodesign, Johnson & Johnson's JLABS and AT&T Foundry.
- The $25 million TMC Venture Fund helps guide early-stage life sciences companies through R&D, operations and clinical testing in preparation for later rounds of investment.

Near Southwest

Emerging and manufacturing lab supply remain stable

- Southwest of the core TMC lab stock cluster is a secondary life sciences market composed of office, flex and manufacturing space.
- The submarket experienced a burst of growth from 2014 to 2017 with the delivery of single-tenant facilities for Lonza Viral Therapy and Merit Medical. With no further new supply infusions and steady demand, vacancy and rental rates were largely unchanged year-over-year.

Los Angeles/Orange County

Supported by a web of leading research universities and a deep pool of talent, the area remains a center of innovation spurning new startups.

Strong education base, innovation and collaboration with the healthcare industry have made life sciences a significant driver for the Orange County economy.

Los Angeles

Spread among West Los Angeles, South Bay, Los Angeles North, San Gabriel Valley and the Santa Clarita Valley submarkets, the Los Angeles life sciences clusters are typically centered near educational or large biotech firms. The region has a large bio-pharmaceutical presence anchored by companies such as Amgen, Kite Pharma and Quest Diagnostics. The region's leading research university is contributing to a large number of new medical discoveries each year, which translates into additional business opportunities.

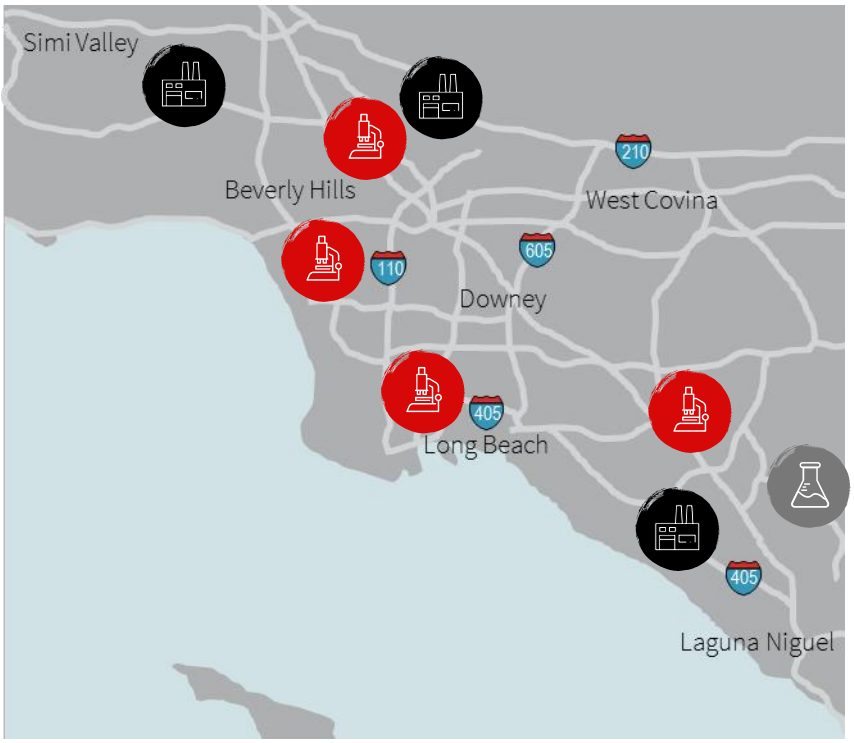
Orange County

Life sciences companies are located throughout Orange County, with the largest clusters found in Airport Area and South County. Primary research institutions include Children's Hospital Orange County, Hoag Hospital, St. Joseph Hospital of Orange, St. Jude Medical Center and University of California Irvine. The local life sciences industry is diverse, being constituted of a wide spectrum of subsectors, with medical device as the largest.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 41.1

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	116,978	2.2%	-4.1%
Establishments	3,097	0.5%	-2.0%

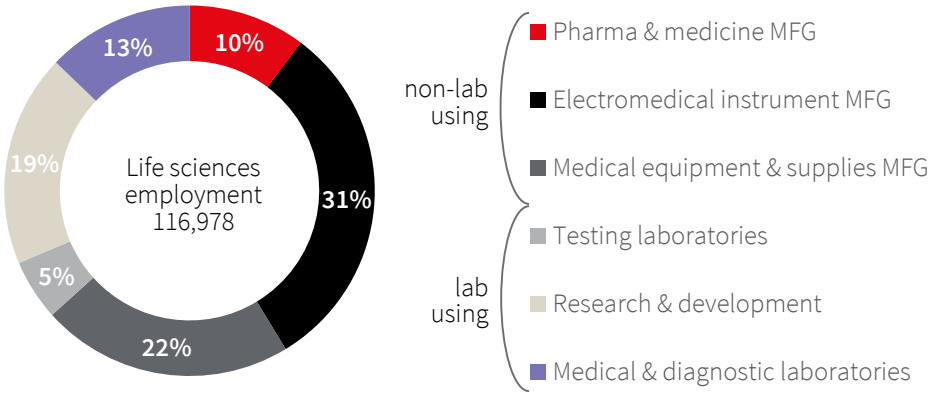
Funding	Total life sciences	% to total U.S.
VC funding	$170.7M	0.9%
NIH funding	$1,291.8M	4.6%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	12.4 m.s.f.	3.3%	$17.79 p.s.f.

The Los Angeles/Orange County region is home to a diversified life sciences cluster characterized by large pharmaceutical companies and medical device firms but also smaller biomedical enterprises and many early-stage startups. Nonprofit BioLA, founded in 2018, will seek to link mature companies, startups, research institutions and investors with the aim of accelerating the area's bioscience ecosystem. Over the last two years, venture capitalists have invested over $324.9 million in promising life sciences companies locally.

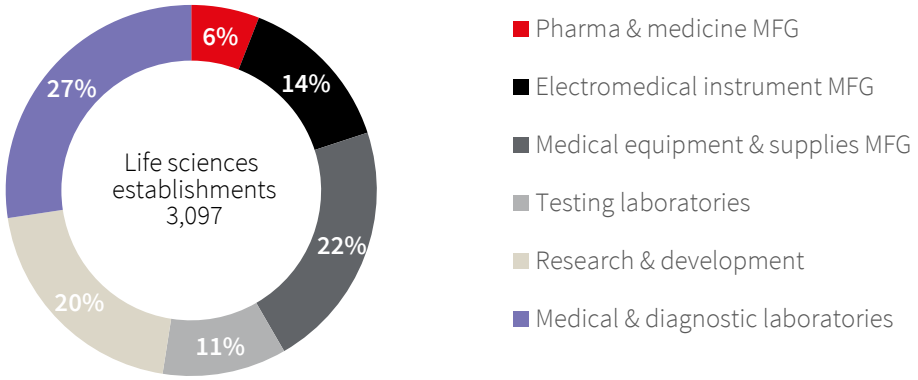
The region's life sciences cluster has been a strong driver of job growth since the 2007 recession. Factors driving employment are medical-based companies entering the Los Angeles/Orange County market, as well as companies currently based there and expanding operations.

Life sciences employment composition



Testing laboratories represent a strong growth opportunity. The Los Angeles and Orange County area is one of the largest metropolitan regions in the country. As the area's population ages, the demand for testing services will only increase.

Life sciences establishment composition



Submarket

Facilities scorecard

Supply	Los Angeles	Orange County
Rentable lab stock	4.5 m.s.f.	4.4 m.s.f.
Owner-occupied lab stock	1.2 m.s.f.	2.3 m.s.f.
(% of total lab stock)	50.1%	49.4%
Total vacancy	3.7%	2.9%
(Change year-over-year)	-0.5ppts	-0.9 ppts
# of large blocks over 50,000 s.f.	2	3
Under construction (s.f.)	98,000 s.f.	100,276 s.f.
Demand		
# of requirements	5	5
Total s.f. requirements	95,985 s.f.	620,000 s.f.
Pricing		
Average asking rent (NNN)	$17.28 p.s.f.	$18.36 p.s.f.
(Change year-over-year)	+3.6%	+0.5%

Recent activity

Kite Pharma
2383 Utah Drive
El Segundo
134,600 s.f.
Class A

The Lawrence J. Ellison Institute for Transformative Medicine of USC
12414 Exposition Blvd.
Los Angeles
80,000 s.f.
Class A

Dendreon
1700 Saturn Way
Seal Beach
184,000 s.f.
Class A

Robinson Pharma
1585 MacArthur Blvd.
Costa Mesa
100,276 s.f.
Class B

Activity key: **Leasing** **Sales** **Under construction**

Los Angeles

Research institutions fuel the demand for lab space

- Los Angeles is strongly positioned for growth supported by leading research centers such as CalTech, UCLA and USC, which continue driving the demand for lab space.
- The Lawrence J. Ellison Institute for Transformative Medicine of USC leased the entirety of a research and lab facility under construction in Culver City. The institute focuses on cancer research and is expected to move in mid-2019 after the project is completed.
- Research firm LA BioMed raised $50 million to construct and equip a new lab research center next to Harbor-UCLA Medical Center. The project will include an 18,000-square-foot incubator for up to 30 biotech firms.
- The region's leading university will continue to supply a deep pool of scientists and entrepreneurs who will be delivering the next medical breakthroughs, driving the need for additional specialized bioscience facilities.

Orange County

Demand for spaces less than 10,000 square feet grows

- Orange County lab inventory is spread across industrial, flex and office properties, with 48 percent from flex, 34 percent from industrial and 17 percent from office.
- Large companies in the market such as Allergan, Edwards Lifesciences, Beckman Coulter, Medtronic and MicroVention are innovation leaders occupying significant amounts of space. However, there are spinoffs and other small and midsize firms looking to set up and grow their local operations. Many of these organizations are having difficulty in locating space due to high specialty build-out costs landlords would incur and lack of availability.
- Life sciences companies are placing a greater emphasis on being highly specialized, and one of the segments experiencing strong growth is ophthalmology, becoming a catalyst in the local market.

Long Island

The partnership of major research institutions has fostered economic growth on Long Island, supporting the goal of creating a national hub for life sciences.

The 103,530-square-foot facility at 49 Mall Drive in Commack is the largest available R&D block in Suffolk County. The space is ideal for a company seeking a corporate research facility.

Nassau County

Recognized for its world-class research institutions, the Nassau County bioscience industry presence continues to be a major source of economic growth on Long Island. The life sciences industry is poised for sustained growth as innovation-focused funding from the state solidifies groundbreaking bio-science initiatives and research projects. Nassau County serves as headquarters to Cold Spring Harbor Laboratory, a 125-year-old biomedical nonprofit laboratory, and is home to many lab-based companies such as Mirimus and Certerra.

Great Neck–based Northwell Health, the largest private-sector employer on Long Island, is expanding rapidly along with its research wing, the Feinstein Institute for Medical Research. The Nassau County life sciences market is mainly composed of owner-occupied laboratory facilities.

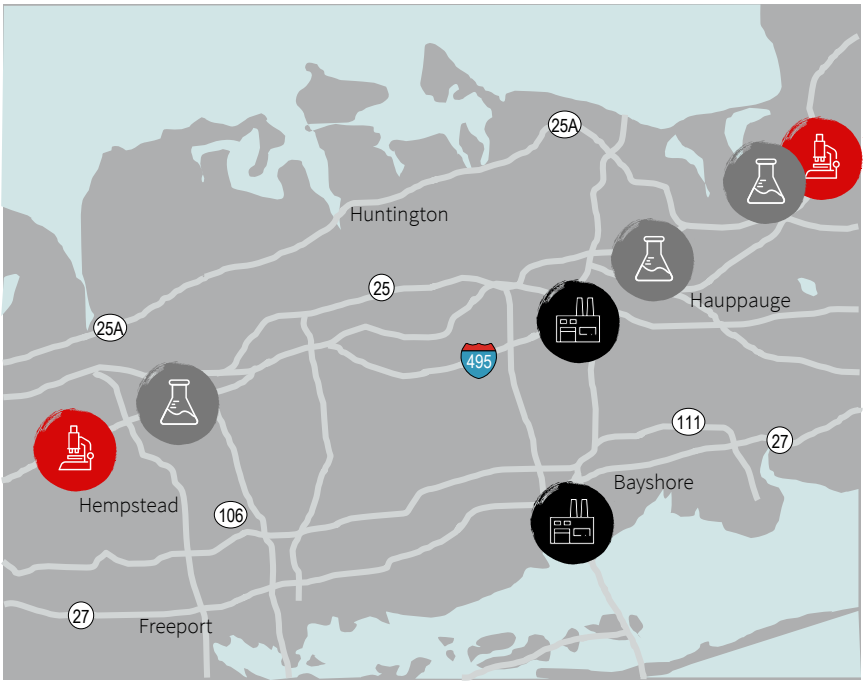
Suffolk County

Stony Brook University serves as an integral part of the research corridor initiative of Long Island. The National Institutes of Health awarded Stony Brook University's Center for Biotechnology a three-year, $3.0 million grant to create the Long Island Bioscience Hub in collaboration with two key partner institutions. Suffolk County is also home to Brookhaven National Laboratory, a 4 million-square-foot multipurpose research lab facility funded by the U.S. Department of Energy. The majority of life sciences establishments are in owner-occupied facilities in a campus setting. In recent years, pharmaceutical companies have dominated commercial activity growth, with the majority concentrated in Central Suffolk.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 23.7

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	28,460	2.6%	1.4%
Establishments	549	0.5%	0.7%

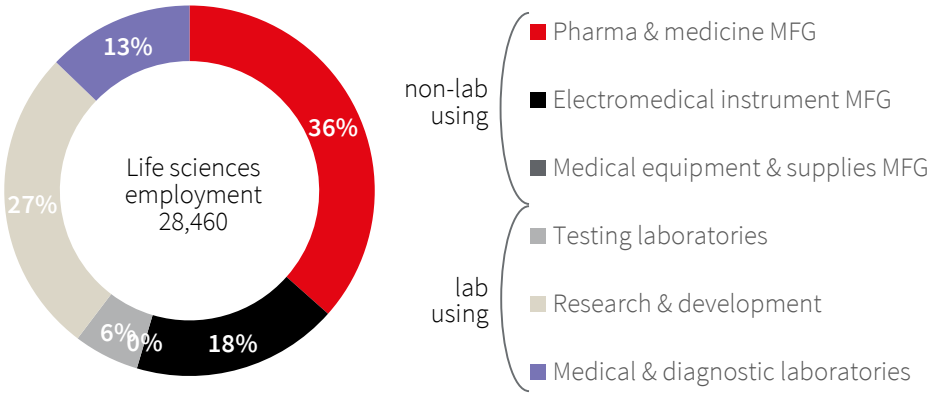
Funding	Total life sciences	% to total U.S.
VC funding	$37.2M	0.2%
NIH funding	$144.2M	0.5%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	1.9 m.s.f.	11.8%	$23.67 p.s.f.

The strengthening of the Long Island research corridor has been steered by several efforts to accelerate the commercialization of bioscience resources, primarily through the Long Island Bioscience Hub. Through a partnership of renowned institutions, Stony Brook University, Brookhaven National Laboratory, Cold Spring Laboratory and Feinstein Institute for Medical Research adjoin their research expertise to foster the development of new discoveries.

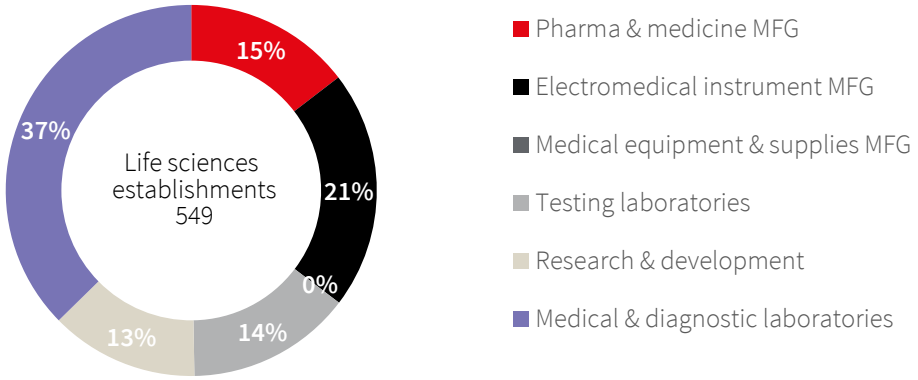
Continued growth in life sciences employment is heavily dependent on the pharmaceutical subsector, as it is the largest component of Long Island's manufacturing sector. According to a Suffolk County IDA report, pharma manufacturing employment has increased 64.0 percent since 2004. Employment is expected to increase once the planned expansion of key pharma companies in Suffolk County comes to fruition.

Life sciences employment composition



An initiative that leverages Long Island's extensive research expertise was recently put into motion, led by a partnership between the Center for Biotechnology and Accelerate Long Island. The Long Island BioMentor Initiative aims to foster a more vibrant bioscience cluster in the region by connecting early-stage bioentrepreneurs with highly distinguished professionals and experienced mentors.

Life sciences establishment composition



Long Island

Facilities scorecard

Supply	Nassau County	Suffolk County
Rentable lab stock	0.6 m.s.f.	0.4 m.s.f.
Owner-occupied lab stock	0.6 m.s.f.	0.2 m.s.f.
(% of total lab stock)	64.1%	35.9%
Total vacancy	7.3%	19.8%
(Change year-over-year)	-2.3 ppts	+3.9 ppts
# of large blocks over 50,000 s.f.	1	1
Under construction (s.f.)	0 s.f.	0 s.f.
Demand		
# of requirements	1	1
Total s.f. requirements	60,000 s.f.	100,000 s.f.
Pricing		
Average asking rent (NNN)	$21.68 p.s.f.	$25.00 p.s.f.
(Change year-over-year)	+20.4%	+0.0%

Recent activity

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

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

Contract Pharmacal Corp
145 Oser Ave.
Commack
17,500 s.f.
Class B

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

Nassau County

Biotech companies look to expand their footprint

- Northwell Health moved 520 employees to its new, 101,000-square-foot lab facility at 450 Lakeville Road in Lake Success. The lab, which cost $59.6 million to build, has the capability to conduct 55 million tests annually.
- Acutis Diagnostics plans to relocate to Hicksville upon receiving approved economic incentives by the IDA. The biotech company will invest nearly $13 million to purchase two acres at 400 Karin Lane and repurpose the existing building to a 40,000-square-foot facility.
- Mispro Biotech Services expanded its footprint in New York with its opening of an 18,000-square-foot facility in Broad Hollow Bioscience Park in Farmingdale.
- Proposed plans for the Nassau Hub development include office use with a focus on life sciences and R&D technology, and will offer incubator, accelerator and coworking space.

Suffolk County

Pharma industry drives economic growth

- Growth within the pharmaceutical sector has driven demand in Suffolk County, particularly in the Hauppauge region, where a majority of pharma companies are based. Contract Pharmacal Corp purchased a 17,500-square-foot manufacturing building at 165 Oser Ave. in Hauppauge to expand another 140,000 square feet into its existing building at 145 Oser Ave.
- Amneal Pharmaceutical is planning to expand its operations further in South Yaphank. The move would create approximately 400 new jobs in the next year.
- The 103,530-square-foot facility at 49 Mall Drive in Commack is currently being marketed for sale. The space is the largest block on the market in Suffolk County.

Minneapolis–St. Paul

Minneapolis–St. Paul is the center of the Medical Alley corridor extending from Duluth to Rochester. In 2018, Minnesota life sciences companies raised $731 million 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.

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. The University Enterprise Laboratory was the first multitenant lab building in the Twin Cities. Incubology, a biotech incubator at the former Imation campus, offers 80,000 square feet of lab and 200,000 square feet of office.

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.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing

Economic Scorecard

Cluster score: 30.8

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	45,750	2.9%	-0.7%
Establishments	742	0.9%	3.8%

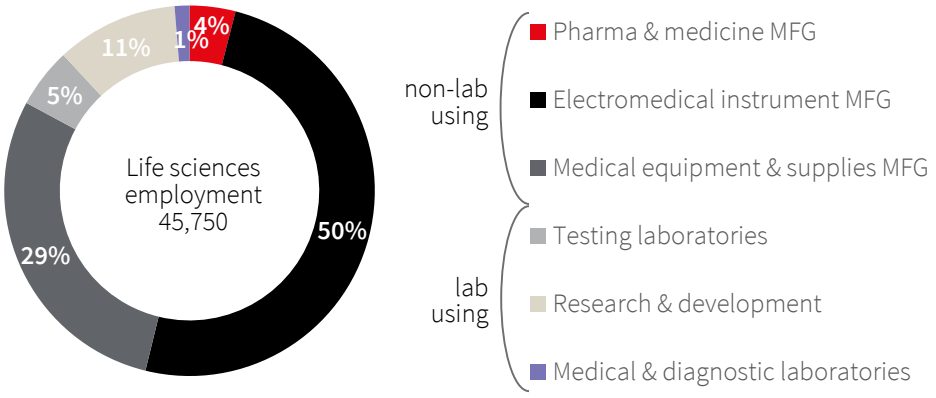
Funding	Total life sciences	% to total U.S.
VC funding	$248.5M	1.2%
NIH funding	$321.3M	1.1%

Inventory	Total supply	% Total vacancy	Average asking rent (Gross)
	0.6 m.s.f.	41.2%	$18–$22 p.s.f.

Minneapolis–St. Paul's life sciences strength started with medical devices, but for decades the economic cluster has been diversifying into other emerging industries such as digital health, biotechnology, pharmaceuticals and diagnostics. This unique mix plus proximity to Rochester's Mayo Clinic makes the Twin Cities one of the most diverse healthcare innovation hubs in the world.

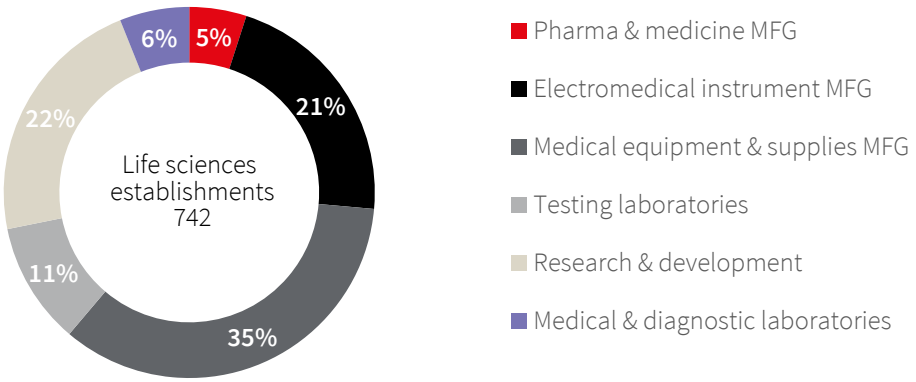
Talent truly differentiates Minneapolis–St. Paul from the rest of its life sciences peers. The metro is one of the most educated in the nation and consistently has one of the lowest unemployment rates. Private-sector and institutional research foster a uniquely innovative health tech cluster, evidenced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

Life sciences employment composition



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.

Life sciences establishment composition



Montréal

The Greater Montréal Area has 1,455 life sciences companies employing over 32,000 people.

Launched in 2017, Québec's strategy for research and innovation includes a $2.8 billion budget to fund research and entrepreneurial initiatives.

West Island & Saint-Laurent

The West Island/Saint-Laurent submarket cluster is home to more than 68 percent of Montréal's occupied inventory for lab and manufacturing space. Tenancies in this cluster are divided evenly between three hubs: Technoparc Montréal, NEXUS 40-13 and the West End. Product in these hubs consists primarily of second-generation lab and manufacturing space and new office developments.

Laval

Laval's Biotech City is the second-largest cluster for occupied lab and manufacturing space in Montréal. With a radius of 3 kilometers, the area is the most dense grouping of life sciences companies in Montréal. Laval is located in a different administrative region than Montréal, meaning companies here benefit from a different structure of tax incentives and credits for the operation of their activities.

Downtown & Periphery

The downtown and its periphery area are seeing a rejuvenation of life sciences facilities with the construction of three major hospitals and research and development centers. These sites, including the McGill University Health Centre super hospital, are being created in partnership with local universities and represent over $5.0 billion in investments.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing

Economic Scorecard

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	32,475	1.6%	17.1%
Establishments	1,455	1.2%	

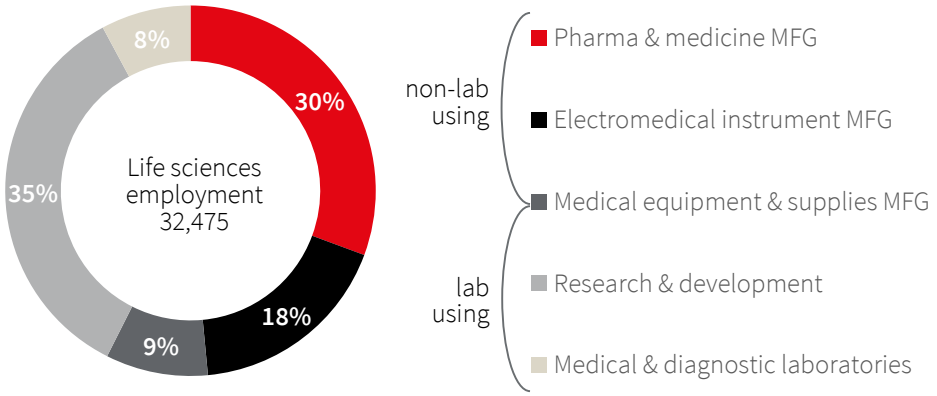
Funding	Total life sciences	% to total Canada
VC funding	$140.4M	46.6%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	1.8 m.s.f.	4.6%	$10.97 p.s.f.

The Greater Area of Montréal currently has 1.8 million square feet of occupied lab space. There was an increase of 0.3 million square feet in the lab space inventory since last year. 22.5 percent of the inventory is owner-occupied. Lab space represents 1.7 percent of Montréal's total office inventory. The majority of Montréal's lab inventory is located in West Island and Saint-Laurent, whereas the majority of office inventory is located in Downtown Montréal.

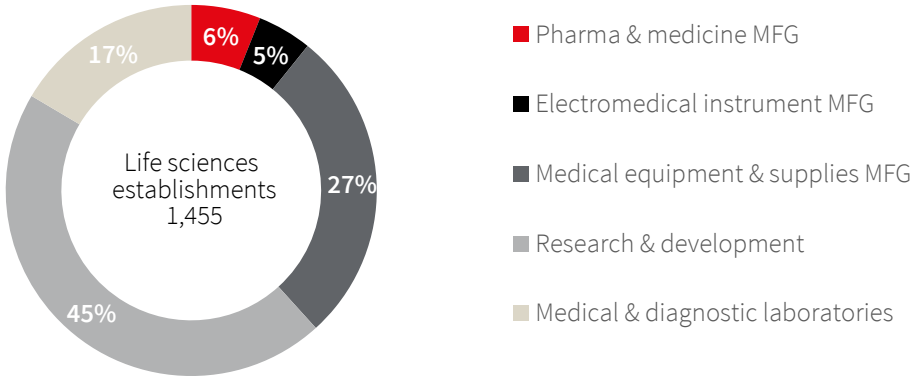
Montréal is home to a deep pool of multilingual and highly trained talent, with two world-class universities in the city. Over 27,000 students study in programs relevant to the life sciences industry and an average of 6,300 students in these programs graduate every year.

Life sciences employment composition



In addition, a weak Canadian dollar compared to the U.S. dollar provides a significant cost incentive, intensified by Montréal's low operating costs. For the life sciences industry, Montréal is ranked first for the lowest operating costs out of North American cities with populations of 2 million or more, enjoying an average cost advantage of 24.0 percent.

Life sciences establishment composition



West Island & Saint-Laurent

Facilities scorecard

Supply	West Island
Rentable lab stock	1.2 m.s.f.
Owner-occupied lab stock	0.3 m.s.f.
(% of total lab stock)	68.2%
Total vacancy	19.3%
(Change year-over-year)	+1.6 ppts
# of large blocks over 50,000 s.f.	5
Under construction (s.f.)	0 s.f.
Demand	
# of requirements	6
Total s.f. requirements	150,778 s.f.
Pricing	
Average asking rent (NNN)	$13,71 p.s.f.
(Change year-over-year)	-5.2%

Recent activity

Peloton Pharmaceuticals
243 Hymus
Pointe-Claire
40,000 s.f.
Class B

McKesson Canada Corp.
9415–9495 Trans-Canada
Saint-Laurent
33,254 s.f.
Class B

VisionX Inc.
210 Brunswick
Pointe-Claire
8,174 s.f.
Class B

NEOMED Commercialization Complex
7171 Frederick Banting
Saint-Laurent
50,000 s.f.

Activity key: **Leasing** **Sales** **Under construction**

Technopark

Hub for life science industry

- In late 2018, Aurora Enterprises, leading cannabis production company, acquired 19.99 percent ownership interest of Capcium, a Montréal-based softgel manufacturer. Capcium is currently operating out of a 48,000-square-foot facility at 1675 Trans-Canada Highway in Pointe-Claire. They look to further expand into a large, pharmaceutical-grade facility slated for delivery in late 2019.
- Vacancy rates are relatively low in both the West Island and Saint-Laurent submarkets. The West Island, however, is experiencing a critically low amount of available industrial space, with industrial vacancy rates now at 1.7 percent. Only about 750,000 square feet of industrial space remains vacant, of which 80 percent of that is leasable.
- NEOMED Institute will receive $3 million in funding from the City of Montréal and the Government of Canada for a new innovation and commercialization complex that will provide small and medium-sized enterprises with customized labs. The construction of a new building will be on the NEOMED Institutes' land at 7171 Frederick Banting. The project is expected to be delivered in 2020, adding 50,000 square feet of space for various facilities.
- NEOMED Institute is a nonprofit organization located in the Technopark in Saint-Laurent. Funded by the government and private companies such as AstraZeneca and Pfizer, NEOMED has the mandate to facilitate the development and growth of life sciences and heath technology in the Greater Montréal area.

Laval

Facilities scorecard

Supply	**Laval**
Rentable lab stock	0.3 m.s.f.
Owner-occupied lab stock	0.1 m.s.f.
(% of total lab stock)	17.5%
Total vacancy	14.7%
(Change year-over-year)	-0.7ppts
# 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)	$14.35 p.s.f.
(Change year-over-year)	+4.8%

Recent activity

BSN Medical Inc.
4451–4479 Laval Highway
Laval
4,854 s.f.
Class A

Mégalab Inc.
901–937 Michelin
Laval
8,420 s.f.
Class B

TÜV SUD Canada Inc.
4479 Laval Highway
Laval
9,285 s.f.
Class A

Activity key: **Leasing** **Sales** **Under construction**

Laval West

Biotech City taking expansion

- Laval is home to the largest concentration of owner-occupied lab space in Montréal, totaling over 130,000 square feet or 8.9 percent of total lab supply.
- Laval has approximately 1.8 million square feet of developable land situated in Armand-Frappier Park, which is composed of a total of 11 million square feet within Biotech City.
- Contract research organization (CRO), New World Laboratories, is planning to leave its current home at 500 Cartier at Armand-Frappier Park to occupy another property in the biotech sector.

Downtown & Periphery

Facilities scorecard

Supply	Downtown
Rentable lab stock	0.2 m.s.f.
Owner-occupied lab stock	0.0 m.s.f.
(% of total lab stock)	11.0%
Total vacancy	9.5%
(Change year-over-year)	-1.1 ppts
# of large blocks over 50,000 s.f.	2
Under construction (s.f.)	0 s.f.
Demand	
# of requirements	3
Total s.f. requirements	32,359 s.f.
Pricing	
Average asking rent (NNN)	$17.50 p.s.f.
(Change year-over-year)	-0.4%

Recent activity

Laboratoire Mequaltech
8740 Pie-IX
Montreal
22,125 s.f.
Class B

SCIREQ Scientific Equip.
6600 St.-Urbain
Montreal
10,443 s.f.
Class B

Intelerad Medical Systems
800 de Maisonneuve East
Montreal
56,544 s.f.
Class A

Activity key: **Leasing** **Sales** **Under construction**

Downtown Core

Innovative ecosystem in the Downtown Core

- Montreal's Innovation District is located downtown. The district is a collaborative initiative supported by École de technologie supérieur (ÉTS), McGill University, Concordia University, Université du Québec à Montréal (UQAM) and the government. The Innovation District has the mission of fostering an ecosystem among academics, entrepreneurs and startups.
- Office vacancy rates have been decreasing continuously for the last 18 months to reach 9.5 percent.

New Jersey

With the highest concentration of scientists and engineers in the world, a large amount of peer companies, as well as top teaching hospitals and universities, New Jersey remains a hub for the pharmaceutical/life sciences sector.

A large portion of the current growth within the state's life sciences sector is being fueled by smaller and midsized pharmaceutical, biotechnology and generic drug companies that are pursuing facilities for their manufacturing operations.

Northern New Jersey

Northern New Jersey includes Bergen, Essex, Hudson, Morris and Passaic counties. The owner-occupied and leased R&D/lab inventory totals approximately 9.4 million square feet. The ON3 campus in Clifton/Nutley remains active, as Quest Diagnostics is developing a new 250,000-square-foot laboratory, which is scheduled to open in early 2021. In addition, Prism Capital Partners is finalizing plans to build a speculative 150,000-square-foot lab building on the ON3 campus.

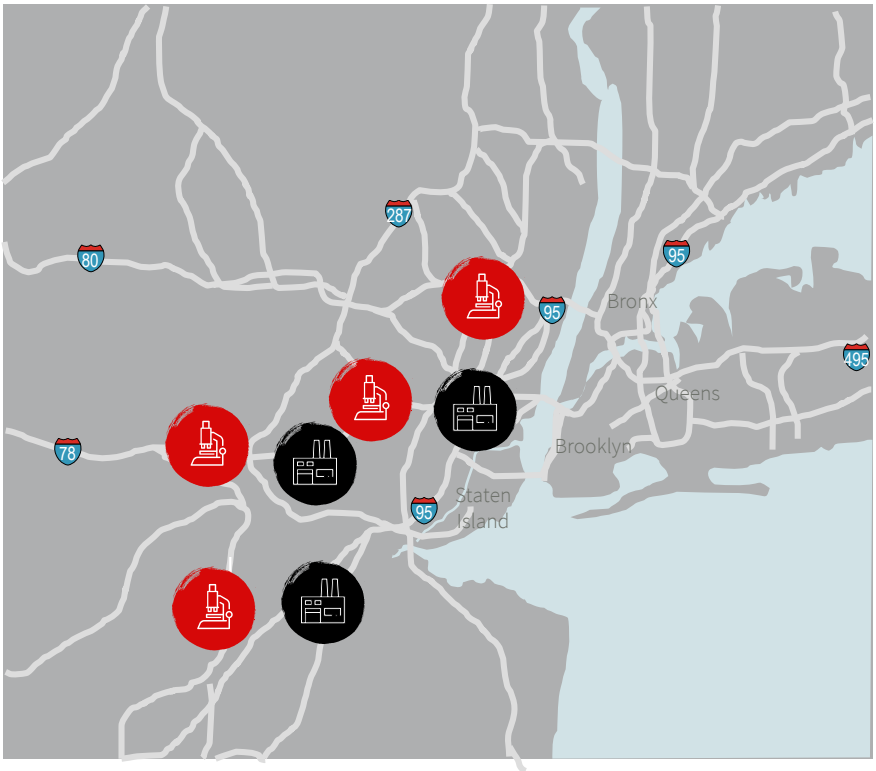
Central New Jersey

Nearly 60.0 percent of the R&D/lab space in the state is concentrated in Central New Jersey, which includes Hunterdon, Mercer, Middlesex, Monmouth, Somerset and Union counties. Totaling 13.4 million square feet, more than three-quarters of this space is composed 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. In early 2019, Bristol-Myers Squibb announced plans to acquire Summit-based Celgene for approximately $74.0 billion. Both life sciences companies have significant facilities in Central New Jersey.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 48.2

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	76,385	3.1%	-3.9%
Establishments	1,711	1.0%	-1.8%

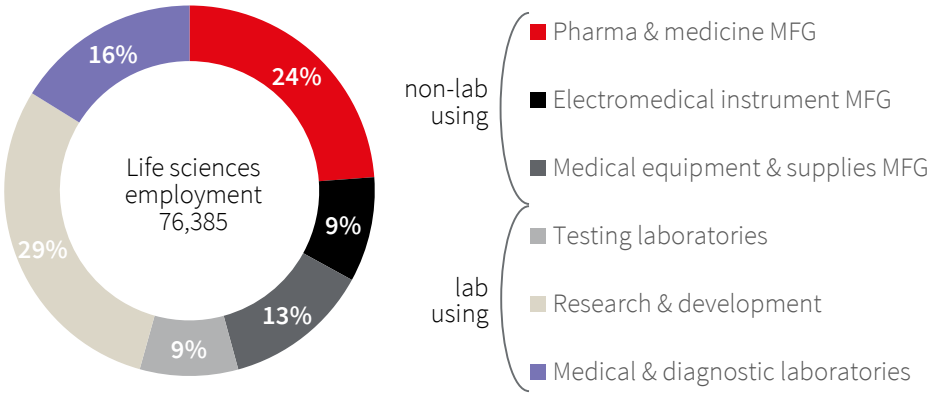
Funding	Total life sciences	% to total U.S.
VC funding	$502.3M	2.5%
NIH funding	$236.7M	0.8%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	22.8 m.s.f.	10.6%	$22.28 p.s.f.

New Jersey's pharmaceutical/life sciences industry remains one of the state's leading economic engines. The state is home to the headquarters or major facilities for 13 of the 20 largest pharmaceutical/life sciences companies in the world. The life sciences industry employed nearly 76,400 people statewide, with an annual economic impact estimated at nearly $50.0 billion. Furthermore, venture capital funding for Garden State companies exceeded $502.3 million in 2018 compared to less than $250.0 million in the prior year.

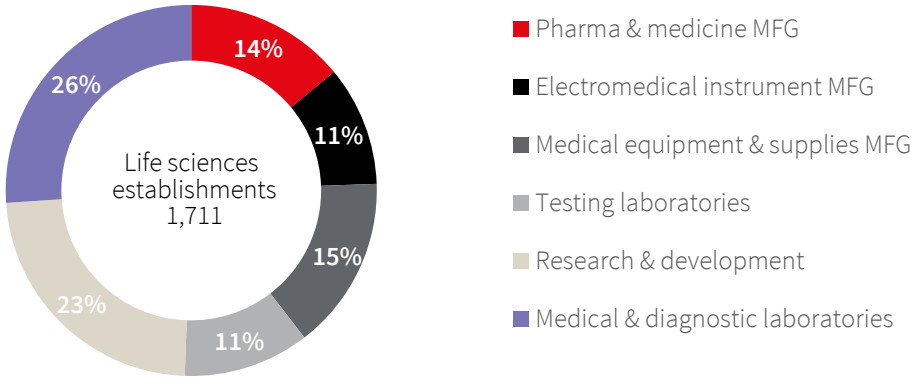
Research & development–focused companies accounted for nearly 30.0 percent of New Jersey's life sciences employment composition. This was followed by the pharmaceutical and medicine manufacturing sector, which housed nearly one-quarter of the jobs in the life sciences sector. Bristol-Myers Squibb, Johnson & Johnson, Merck, Novartis and Pfizer are among the state's most recognized employers in this cluster.

Life sciences employment composition



Future expansion within New Jersey's life sciences sector will be generated by smaller and midsized companies that are moving into the campuses formerly occupied by larger pharmaceutical players. The repurposing of large vacant life sciences campuses, including New Jersey Center of Excellence in Bridgewater, New York Center for Innovation in Pearl River, New York, and ON 3 in Clifton/Nutley, are helping to provide lab space opportunities for growing biotech companies.

Life sciences establishment composition



New Jersey

Facilities scorecard

Supply	Northern NJ	Central NJ
Rentable lab stock	3.2 m.s.f.	3.1 m.s.f.
Owner-occupied lab stock	6.2 m.s.f.	10.3 m.s.f.
(% of total lab stock)	41.2%	58.8%
Total vacancy	18.0%	5.3%
(Change year-over-year)	-0.2 ppts	+0.4 ppts
# of large blocks over 50,000 s.f.	7	6
Under construction (s.f.)	250,000 s.f.	0 s.f.
Demand		
# of requirements	25	14
Total s.f. requirements	2,073,000 s.f.	753,500 s.f.
Pricing		
Average asking rent (NNN)	$22.09 p.s.f.	$22.39 p.s.f.
(Change year-over-year)	-0.3%	+8.4%

Recent activity

Quest Diagnostics
ON3
Clifton, NJ/Route 80/23
250,000 s.f.
Under construction

Legend Biotech USA
2101 Cottontail Lane
Somerset, N.J./Lower 287
85,370 s.f.
Biologics manufacturing facility purchase

Teva Pharmaceuticals
400 Interpace Parkway
Parsippany, NJ/Parsippany
345,500 s.f.
Class A lease

Celularity
170 Park Ave.
Florham Park, NJ/Route 24
147,220 s.f.
Class A lease

Activity key: **Leasing** **Sales** **Under construction**

Northern New Jersey

ON3 campus continues to generate headlines

- Quest Diagnostics is developing a new 250,000-square-foot laboratory at ON3, the former Roche Clifton/Nutley research campus. Slated to open in early 2021, the lab will house more than 1,100 employees and be the largest facility in the Quest network.
- Amid strong demand for R&D space, Prism Capital Partners is finalizing plans to build a speculative 150,000-square-foot lab building on the ON3 campus.
- Teva Pharmaceuticals signed a 345,500-square-foot renewal and expansion at 400 Interpace Parkway in Parsippany, after being awarded a 10-year $40.0 million tax credit. The Israel-based generics manufacturer will be moving its U.S. headquarters from Pennsylvania as part of the expansion.
- Celularity leased 147,220 square feet at 170 Park Ave. in Florham Park. The biotechnology company is consolidating its headquarters, manufacturing and R&D operations from Warren.

Central New Jersey

New headquarters leases drive recent demand

- Bristol-Myers Squibb announced plans to acquire Summit-based Celgene for approximately $74.0 billion. Both life sciences companies maintain large footprints in New Jersey and collectively have more than 5,000 employees in the state.
- Insmed signed a long-term lease involving 117,020 square feet for its new headquarters at 700 Route 202/206 in Bridgewater. Exeter Property Group is planning major renovations to modernize the office building.
- Genmab leased 90,070 square feet of office and lab space for its new U.S. headquarters at 777 Scudders Mill Road–Building 2 in Plainsboro. The 675,000-square-foot three-building complex was formerly occupied by Bristol-Myers Squibb. Genmab was approved for a 10-year, $12.8 million state tax credit to relocate and expand its operations from 902 Carnegie Center in Princeton.

New York City

New York City is positioned to emerge as a top life sciences cluster based on its access to talent.

Several leading life sciences developers have recently made bold acquisitions throughout New York City, signaling the next areas of growth in this budding industry segment.

Manhattan

Supply is limited to five developing clusters in Manhattan: Midtown East/Kips Bay, Hudson Square, Midtown West, West Harlem (Manhattanville) and Long Island City. This is partly based on preexisting supply, access to labor force and zoning regulations. There are several proposed and ongoing projects, including ground-up developments and conversions, that will advance lab space offerings in the coming years in existing and alternative submarkets.

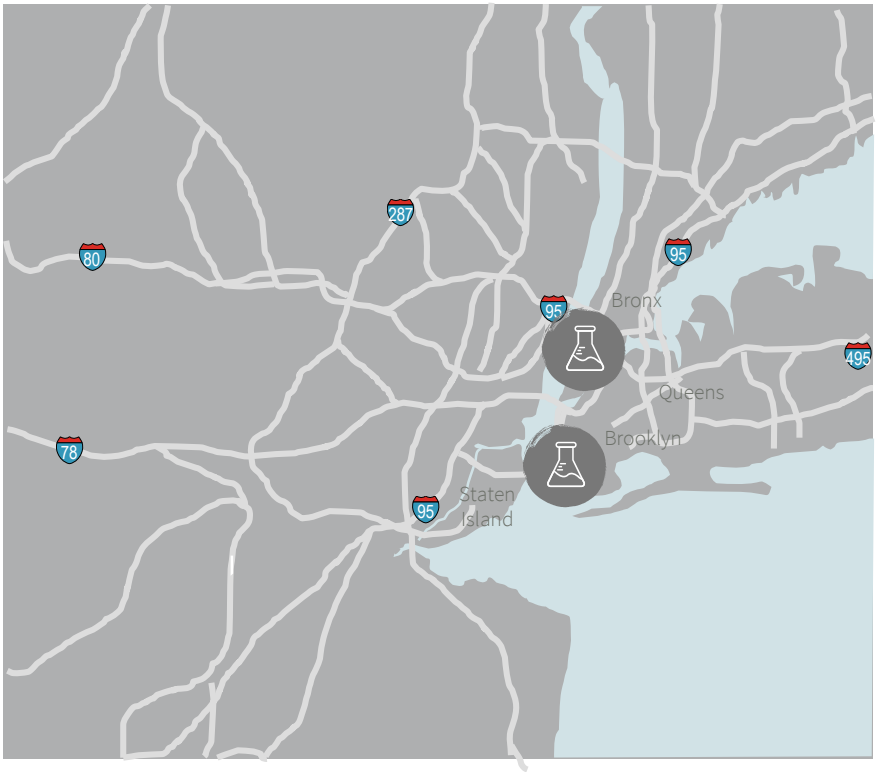
Outer Boroughs

The life sciences industry is poised to gain traction in Long Island City and Brooklyn based on recent investment activity. For example, the Bindery was acquired by Alexandria Real Estate Equities and 45-18 Court Square West was acquired by a joint venture between King Street Properties and GFP Properties. Both properties will be converted from industrial to lab and office space.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 34.1

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	14,226	0.4%	-2.7%
Establishments	1,108	0.4%	1.5%

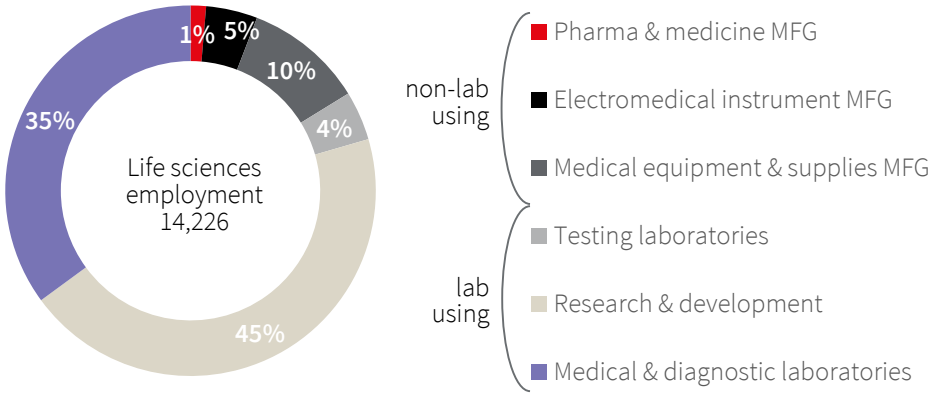
Funding	Total life sciences	% to total U.S.
VC funding	$671.9M	3.3%
NIH funding	$1,955.9M	7.0%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	2.5 m.s.f.	11.9 %	$79.93 p.s.f.* *Manhattan only

Access to the healthcare and life sciences labor force is one of the top drivers of this industry in New York City. The healthcare sector has flourished by adding approximately 185,000 jobs, or 33.8 percent, during the current economic growth cycle. Job growth has demonstrated few signs of slowing, which should encourage new supply additions to meet developing demand.

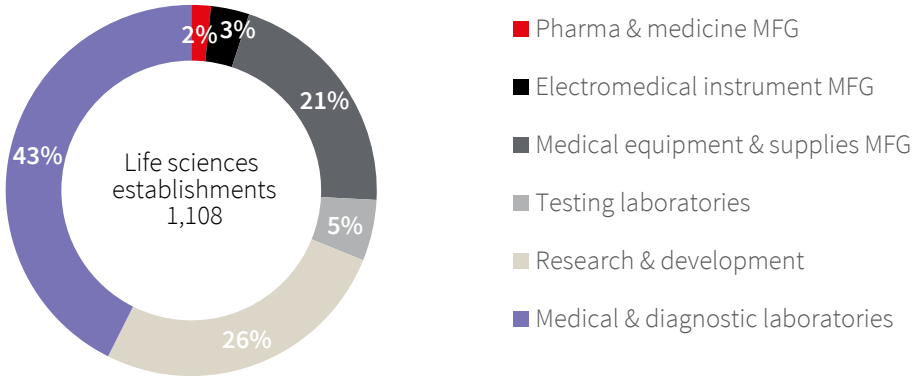
The growing lab clusters in New York City will be partially determined based on their proximity to medical/research institutions and properly zoned development sites. For example, the Alexandria Center for Life Science in Midtown East is located close to NYU Langone, and the Mink Building and Malt House in Harlem are close to Columbia University.

Life sciences employment composition



However, there is a limited supply of properly zoned lab sciences spaces in New York City, which serves as one of the industry's major hindrances for continued growth. One district that is largely M-zoned but located proximate to public transit is Long Island City, which is a rapidly emerging life sciences district.

Life sciences establishment composition



New York City

Facilities scorecard

Supply	Manhattan	Outer Boroughs
Rentable lab stock	1.74 m.s.f.	711,000 s.f.
Owner-occupied lab stock	378,000 s.f.	0 s.f.
(% of total lab stock)	71.0%	29.0%
Total vacancy	9.3%	19.8%
(Change year-over-year)	-1.2 ppts	+66.2 ppts
# of large blocks over 50,000 s.f.	2	2
Under construction (s.f.)	350,000 s.f.	0 s.f.
Demand		
# of requirements	N/A	N/A
Total s.f. requirements		
Pricing		
Average asking rent (NNN)	$79.93 p.s.f.	$50.81 p.s.f.
(Change year-over-year)	-0.1%	+103.2%

Recent activity

The Bindery
32-02 48th Ave.
Long Island City
175,000 s.f.
Class B

45-18 Court Square West
Long Island City
263,000 s.f.
Class TBD

HiberCell
619 W. 54th St.
15,000 s.f.
Class B

Taystee Lab Building
450 W. 126th St.
Harlem
350,000 s.f.
Class A

Quentis Therapeutics
1361 Amsterdam Ave.
10,000 s.f.
Class C

Pfizer World Headquarters*
219 E. 42nd St.
350,000 s.f.
Class B
*Sale-leaseback

Activity key: **Leasing** **Sales** **Under construction**

Manhattan

Supply remains limited but is expected to grow

- Alexandria Real Estate has announced the launch of its Third Tower in Midtown East, expanding the campus to more than 1.0 million square feet. There will be a combination of office and lab space, which will cater to different biotech startups and world-class academic institutions. This is expected to deliver in 2022.
- The Taystee Building is under construction and is expected to deliver in late 2020. The project will anchor the nascent Manhattanville Factory District in Harlem as one of the larger office properties in Upper Manhattan.
- New York City is home to many incubators, such as JLABS, BioLabs and LaunchLabs. These incubators are expected to graduate almost one hundred startups in total, which would cause occupier demand in this industry to accelerate.

Outer Boroughs

Significant investor interest stirs activity in the outer boroughs

- King Street Properties and GFP Real Estate have teamed up to convert an old warehouse near Court Square in Long Island City into lab and office space. This $240.0 million biotech center will add approximately 263,000 square feet to the market.
- Alexandria Real Estate will expand its footprint after acquiring the Bindery at 30-02 48th Ave. for $75.0 million. This adds nearly 175,000 square feet to their portfolio.
- Government incentives such as a real estate tax abatement have helped drive momentum as well.

Philadelphia

The region achieved a new record for VC funding in the past year ($1.4 billion) and will see its largest exit close this year (Roche's $4.8 billion acquisition of Spark Therapeutics).

The region's dominance in gene therapy is increasingly apparent as research hospitals make investments and spinout companies continue to conduct commercialization deals.

Urban (University City, Navy Yard)
Critical mass continues to build within city limits as companies make moves to collaborate with the growing gene and immunotherapy cluster: Amicus Therapeutics, a Princeton-area biopharmaceutical company, is building out a 75,000-square-foot Global Research and Gene Therapy Center of Excellence on three floors of 3675 Market in University City. CA-based Iovance Biotherapeutics broke ground this June on a 136,000-square-foot lab and office facility at the Navy Yard, adjacent to a fourth building under way for WuXi AppTec's growing workforce.

The city's research hospitals fuel this growing industry: Children's Hospital unveiled a $75 million clinical manufacturing facility at its University City campus earlier this year. Next door, the University of Pennsylvania leads the world in the race to patent CAR T-cell research, with 428 patents filed for 54 separate inventions, nearly quadruple the second-place institution in this field. The university's veterinary school has also driven innovation in animal healthcare: Scout Bio raised $20 million this year to advance its work in treating major chronic pet health conditions.

Suburban (Route 202 Corridor)
Companies across the western suburbs made headlines with significant capital raises. Exton-based Fibrocell entered a $135 million deal with Castle Creek Pharmaceuticals to develop a treatment for a rare genetic condition. Also in 2019, Radnor-based Cabaletta Bio announced a $50 million Series B round that it will use to accelerate development of its lead drug candidate as well as build out its manufacturing capabilities. Plymouth Meeting–based Geneos Therapeutics, itself a spinoff of Inovio, raised $10.5 million in a Series A round.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing

Economic Scorecard

Cluster score: 47.2

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	54,709	2.2%	-3.3%
Establishments	1,640	0.9%	-3.9%

Funding	Total life sciences	% to total U.S.
VC funding	$358.3M	1.8%
NIH funding	$1,009M	3.9%

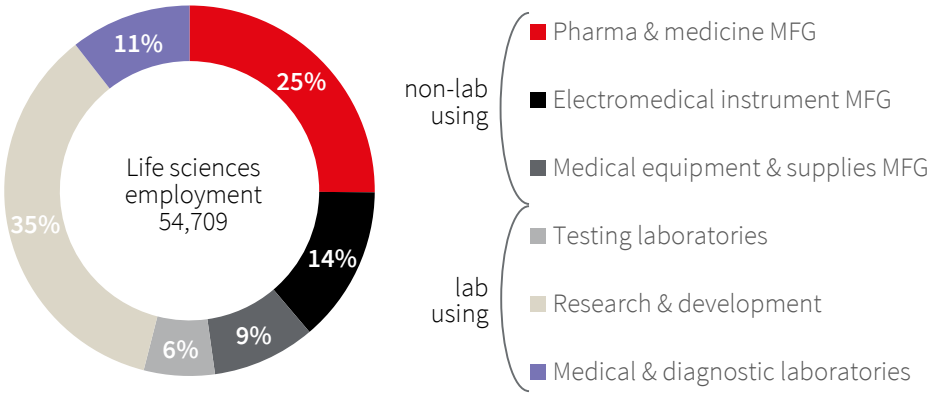
Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	10.6 m.s.f.	6.8%	$28.20 p.s.f.

Philadelphia's economy is humming along thanks to ongoing gains in both population and jobs. In 2018 the city added more jobs in a single year—15,400—than any previous one-year gain since the Bureau of Labor Statistics began tracking this trend. The previous high was also in this cycle, when the city added 13,600 jobs in 2016. The suburbs have surpassed their previous peak's employment levels and continue to see expansion, but the city is outpacing them significantly. Philadelphia's job levels are 9.3 percent ahead of 2008 levels, whereas the PA suburbs stand 2.9 percent ahead of that same marker.

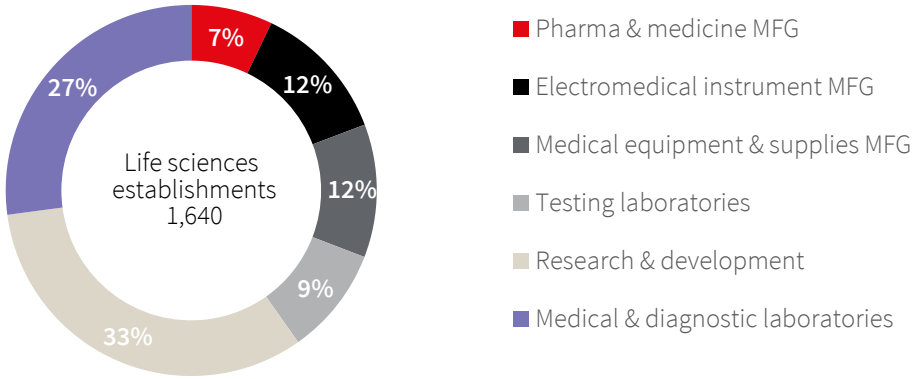
A record-breaking year for VC deals across the region meant significant raises for companies at different stages of maturity. The top 10 deals of the past year in Philadelphia raised a combined $475 million, with the amount of Bay Area and overseas investment in the region picking up significantly. The University of Pennsylvania launched a $50 million biotech fund to target investment in companies that remain in the area, its attempt to accelerate and retain growing firms across the region.

University City remains the undisputed innovation anchor of the region as it continues to grow: R&D expenditures at local institutions approached $1.5 billion, up 26 percent from the previous year. 40 percent of all of Pennsylvania's NIH funding is awarded to those same institutions (more than $732 million in 2018). This has facilitated the issuance of more than 160 patents in each of the past four years. With millions of square feet of new research facilities planned, this engine is still accelerating.

Life sciences employment composition



Life sciences establishment composition



Philadelphia

Facilities scorecard

Supply	Urban	Suburban
Rentable lab stock	2.2 m.s.f.	5.2 m.s.f.
Owner-occupied lab stock	693,000 s.f.	4.9 m.s.f.
(% of total lab stock)	23.8%	73.0%
Total vacancy	2.8%	8.1%
(Change year-over-year)	+50 ppts	-140 ppts
# of large blocks over 50,000 s.f.	0	4
Under construction (s.f.)	239,000 s.f.	0 s.f.
Demand		
# of requirements	1	3
Total s.f. requirements	12,000 s.f.	135,000 s.f.
Pricing		
Average asking rent (NNN)	$38.00 p.s.f.	$23.79 p.s.f.
(Change year-over-year)	0%	4.3%

Recent activity

Iovance Biotherapeutics
300 Rouse Blvd.
Philadelphia
136,000 s.f.
Class A

Amicus Therapeutics
3675 Market St.
Philadelphia
75,000 s.f.
Class A

Harmony Biosciences
630 W. Germantown Pike
Plymouth Meeting
15,651 s.f.
Class A

Jefferson Institute for Bioprocessing
727 Norristown Road
Lower Gwynedd
25,000 s.f.
Class A

Activity key: **Leasing** **Sales** **Under construction**

Urban

Critical mass is building around gene and immunotherapy

- 2019 is notable for the amount of current and proposed construction: WuXi AppTec, an existing company, and Iovance Biotherapeutics, a new-to-market company, are developing lab and research facilities adjacent to one another at the Navy Yard. Both are expected to open sometime in 2021.
- Meanwhile in University City, Spark is fitting out its new headquarters at the Bulletin Building, the first phase of Schuylkill Yards. A Washington-based investment partnership has proposed a 125,000-square-foot spec lab building on an adjacent site. Farther west on Market Street, the Wistar Institute has signed on to partner on University Place 3.0, a $100 million research hub under development by University Place Associates. These projects are moving in parallel to the planned lab buildings at uCity Square and Schuylkill Yards.

Suburban

A mixed bag for suburban firms with raises, job announcements

- MLP Ventures is developing a $500 million lab coworking campus, the largest of its kind in the region. IQ Connect, a 100,000-square-foot incubator, will be a tenant.
- Several suburban life sciences firms had promising raises in the last year, including Trice Medical ($18.3 million for minimally invasive diagnostic devices), Fibrocell ($135 million) and Cabaletta ($50 million).
- More mature firms are planting roots, such as Harmony Bioscience's new corporate headquarters in Plymouth Meeting, where it now employs 42 people only two years after spinning out of Paragon Biosciences.
- A number of established firms cut jobs throughout the past year: GSK will shed as many as 250; Synergy Pharmaceuticals shut its doors at its Chesterbrook facility, eliminating 137 jobs; and Medtronic closed its Bala Cynwyd office, taking 63 jobs with it.

Raleigh-Durham

Raleigh-Durham has a long-standing history as a life sciences hub. Of the 700+ life sciences companies located in North Carolina, nearly 600 are in the region.

In addition to three Tier 1 universities—Duke, NC State University and UNC Chapel Hill—Raleigh-Durham is home to seven other four-year colleges and universities.

Downtown Durham

Downtown Durham, known for its innovative and collaborative ecosystem, is a favorite among life sciences companies thanks to its proximity to Duke University and the growing community of entrepreneurs and incubators. The urban submarket has seen tremendous growth over the last few years as the war for talent has heated up and companies look to distinguish themselves with downtown amenities.

RTP/RDU

RTP/RDU is not only Raleigh-Durham's most concentrated life sciences submarket but is also home to the Research Triangle Park (RTP), one of the largest research parks in the United States. Founded in the 1950s, RTP gained momentum when IBM decided to build a 600,000-square-foot research facility in the 1960s. Since then, the submarket has grown to include industry giants such as Monsanto, Bayer CropScience, BASF, GlaxoSmithKline, LabCorp and Biogen.

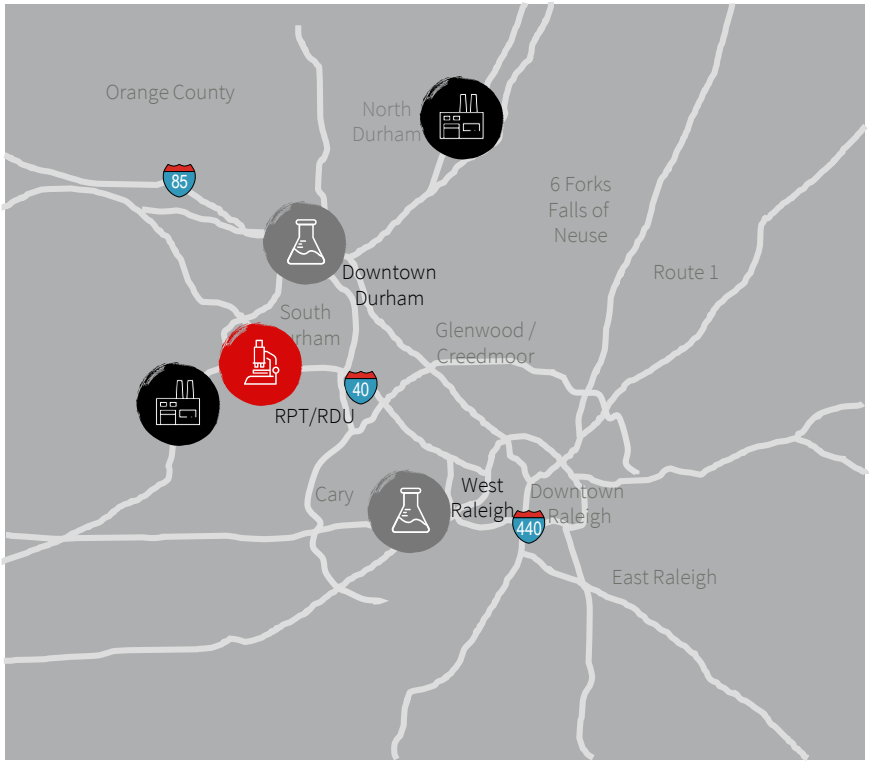
West Raleigh

North Carolina State University and its Centennial Campus lead the development of lab space in the West Raleigh submarket. The campus has become a core research-oriented micro region for a number of reasons. Not only does Centennial Campus offer easy access to talent, the university facilitates corporate-partnered research in a thriving collegiate environment.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 64.3

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	36,507	5.3%	1.1%
Establishments	984	2.1%	-2.0%

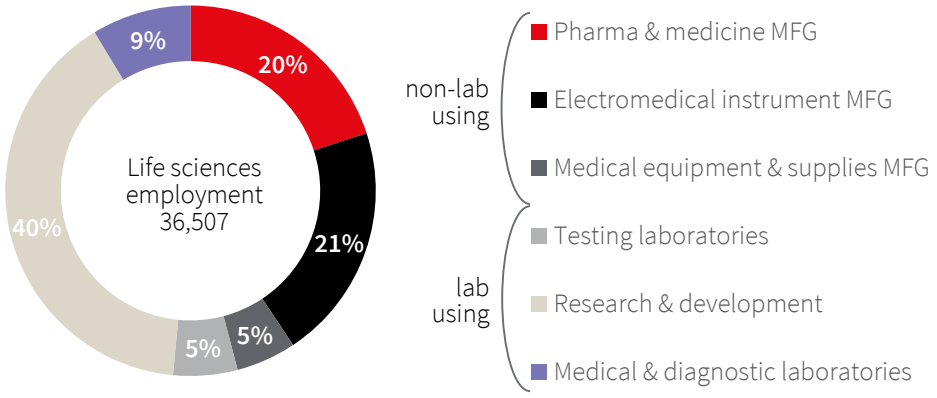
Funding	Total life sciences	% to total U.S.
VC funding	$380.2M	1.9%
NIH funding	$602.1M	2.1%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	14.7 m.s.f.	15.6%	$23.21 p.s.f.

Life sciences and biotechnology companies are attracted to Raleigh-Durham's top-notch higher education system, talent pipeline and innovative ecosystem. Each year, more than 120,000 students enroll in the region's colleges and universities, and more than 5,000 graduate with a STEM degree annually. More than 47.0 percent of adults have a bachelor's degree or higher, cementing the region's status as a "smart" market.

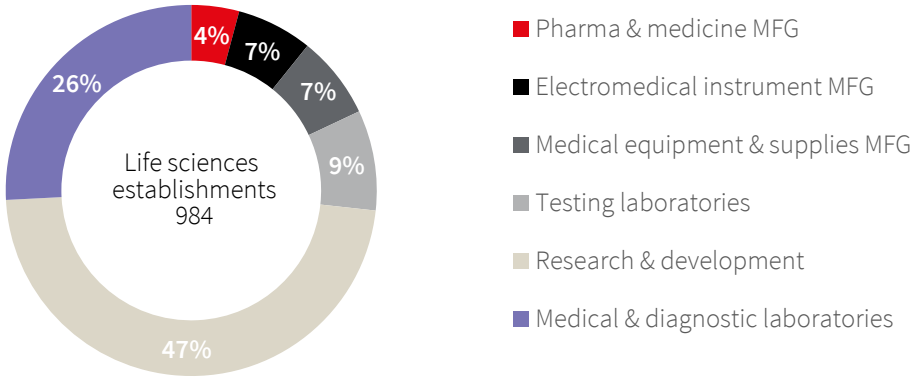
Life sciences entrepreneurs in North Carolina raised more than $730.4 million in equity in 2018, accounting for over a quarter of the $2.7 billion in equity raised by startups across the state. Funding is increasingly coming from out of market as Raleigh-Durham's and North Carolina's reputations for success in the startup community grows.

Life sciences employment composition



Raleigh-Durham's roster of life sciences companies spans the gamut, ranging from global corporations such as LabCorp and Stryker to homegrown companies Redbud Labs and BioCryst Pharmaceuticals. The diversity of companies that make up the market's industry cluster has helped foster support from local institutions.

Life sciences establishment composition



RTP/RDU

Facilities scorecard

Supply	RTP/RDU
Rentable lab stock	7.5 m.s.f.
Owner-occupied lab stock	2.8 m.s.f.
(% of total lab stock)	70.1%
Total vacancy	19.8%
(Change year-over-year)	-5.2 ppts
# of large blocks over 50,000 s.f.	11
Under construction (s.f.)	0 s.f.
Demand	
# of requirements	13
Total s.f. requirements	1.1 m.s.f.
Pricing	
Average asking rent (NNN)	$22.85 p.s.f.
(Change year-over-year)	+18.5%

Recent activity

Parmer Ellis
2400 Ellis Road
RTP
322,384 s.f.
Class B

Bayer CropScience NC Portfolio
2 TW Alexander Drive, 26 Davis Drive
BASF Corporation
454,826 s.f.
$108.44/s.f.

LabCorp
Parmer RTP
5 Moore Drive
RTP
200,000 s.f.
Class B

Parmer RTP
5 Moore Drive
RTP
501,833 s.f.
Class B

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

RTP/RDU

RTP/RDU sees growth across life science sectors

- Alexandria Real Estate Equities has completed phase 1 of the Alexandria AgTech Center in RTP/RDU. Touted as the country's first integrated multitenant agtech research and development and greenhouse campus, the former Syngenta campus now boasts 175,000 square feet of laboratory, greenhouse and office space. The facility is 100.0 percent occupied by tenants such as Arysta LifeScience, Syngenta Crop Protection and Indigo Ag. Phase 2 of the development is presently proposed and is expected to provide an additional 160,000 square feet to the campus.
- In mid-2018, BASF Corporation acquired Bayer AG's seed and herbicide businesses. As part of the acquisition, BASF Corporation bought three office and industrial properties in the RTP/RDU submarket. The three buildings total 454,826 square feet and sold for a total of $49,320,000, approximately $108.44 per square foot.
- After receiving marketing authorization from the FDA for its Quantra Hemostasis analyzer platform, HemoSonics plans to quadruple its Raleigh-Durham headcount. The company plans to expand to 45,000 square feet.
- In the first quarter of 2019, bluebird bio opened its Durham manufacturing facility. The 125,000-square-foot facility was purchased by bluebird in 2017 for $11.4 million and is large enough to accommodate future expansion.

Downtown Durham & West Raleigh

Facilities scorecard

Supply	Downtown Durham	West Raleigh
Rentable lab stock	571,000 s.f.	275,000 s.f.
Owner-occupied lab stock	115,000 s.f.	141,000 s.f.
(% of total lab stock)	4.7%	2.8%
Total vacancy	0.0%	0.5%
(Change year-over-year)	-2.2 ppts	-2.8 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	4
Total s.f. requirements	245,000 s.f.	408,000 s.f.
Pricing		
Average asking rent (NNN)	$29.50 p.s.f.	$31.50 p.s.f.
(Change year-over-year)	+0.0%	+5.9%

Recent activity

Pairwise
800 Taylor St.
Durham
36,000 s.f.
Class A

Precision BioSciences
302 E. Pettigrew St.
Durham
39,000 s.f.
Class B

Venable Center
302 E. Pettigrew St.
Wheelock Street Capital, Trinity Capital, SLI Capital
52,118 s.f.
$306.57/s.f.

Agricultural Sciences Center
4300 Reedy Creek Road
Raleigh
225,000 s.f.
Class A

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

Downtown Durham

Lab availabilities 100.0 percent leased in Downtown Durham

- Downtown Durham's entrepreneurial ecosystem thanks to incubator American Underground, BioLabsNC and Duke University has promoted the submarket's recent growth. Companies looking to maximize these advantages have few options though.
- With the completion of the first phase of Longfellow's Durham Innovation District (Durham ID), lab availabilities in the Downtown Durham submarket have fallen to 0 s.f. Looking forward, the development is anticipated to add 1.0 million square feet of lab/office space to the tight submarket.

West Raleigh

University preps for largest private project to date

- Much of the recent lab development in West Raleigh has been done in partnership with NC State University. The most recent submarket delivery, the Biomedical Partnership Center, completed construction in 2017 and is now 94.5 percent leased.
- The university's Centennial Campus has played a crucial part in fostering innovation and collaboration in the market. Through public-private partnerships with government and industry, a center of collaboration is formed.

San Diego

After record-high venture capital funding in 2018, the San Diego life sciences cluster generated 320,896 square feet of total leasing activity during the first quarter of the year. This leasing is 9 percent higher than the first-quarter average over the previous five years, pushing 2019 off to a healthy start.

Despite the large drop in VC funding at the beginning of the year, things appear to be turning around early in the second quarter of 2019. Poseida Therapeutics secured $142 million through a Series C round of financing in mid-April and Vividion Therapeutics pulled in an $82 million Series B round during the last week of April.

Torrey Pines
Torrey Pines is 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 and is home to acclaimed research institutes, large pharmaceutical companies and successful biotechs ranging from startups to mature companies.

UTC/Campus Point
UTC is located on the east side of UC San 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 markets.

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 industrial and flex buildings into wet lab facilities. The submarket is also a regional hub for hi-tech companies.

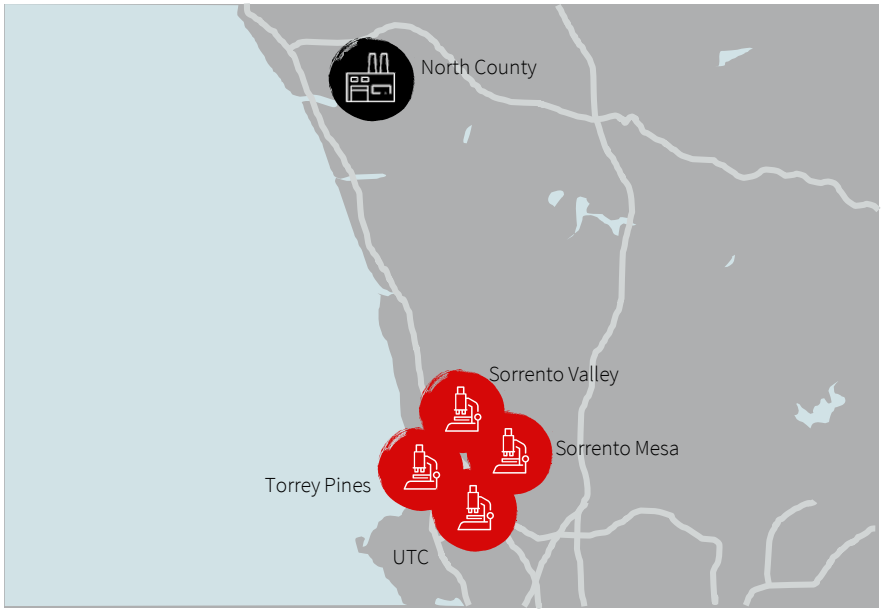
Sorrento Valley
Sorrento Valley developed as an ancillary market to Torrey Pines and today continues to be home to many of San Diego's life sciences companies. With a base of older industrial and flex buildings that have been converted to lab space, this submarket has historically provided a more economical alternative for early- and mid-stage companies.

North County
North County is situated about 30 minutes north of San Diego's primary life sciences cluster. The North County life sciences submarket is anchored by a handful of large companies, and a significant amount of the composition includes manufacturing. North County has carved out a healthy niche apart from the primary San Diego life sciences cluster.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 71.6

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	66,781	5.5%	0.3%
Establishments	1,503	1.4%	1.9%

Funding	Total life sciences	% to total U.S.
VC funding	$2,423M	12.1%
NIH funding	$921.1M	3.3%

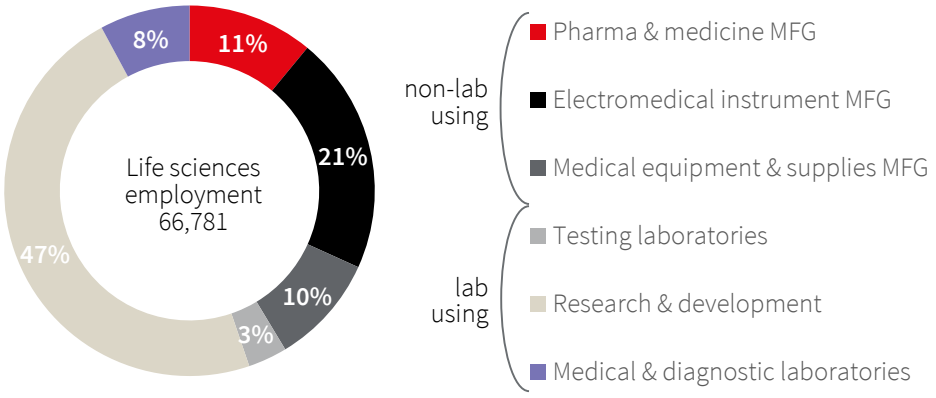
Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	18.4 m.s.f.	6.6%	$47.28 p.s.f.

San Diego, with its rich pool of R&D talent and new company formations, is known for continually producing companies with advanced technologies that position them for acquisition. Global biotech and pharma companies continue to depend on early-stage biotechs to drive innovation, and San Diego has proven it can do just that. M&A activity was highlighted by Bristol-Myers Squibb's announcement in January that it would be acquiring Celgene for $74 billion (the acquisition was formally approved in April). Celgene currently has four locations in the San Diego biotech cluster.

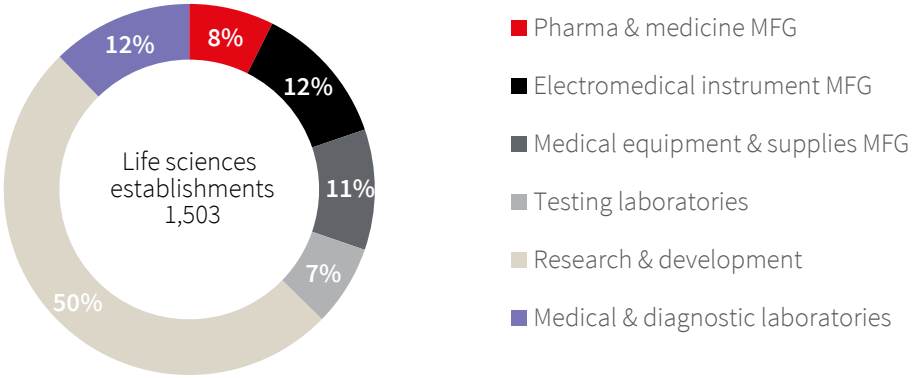
Despite the U.S. government shutdown in the first part of the year, the IPO window for life sciences companies remained open. San Diego biotech Gossamer Bio led the pack with a $276 million IPO in February. The San Diego life sciences sector certainly benefited from the IPO market. In 2018, IPO filings by San Diego companies were very robust, with over $530 million of active filings. Deals include Gossamer Bio ($230M), Poseida Therapeutics ($115M), Cibus ($100M) and Cirius Therapeutics ($86M).

The San Diego life sciences cluster generated 320,896 square feet of total leasing activity during the first quarter of the year. Leases signed during the quarter produced only 77,656 square feet of positive net occupancy growth, a sharp decrease from the same period in 2018. The reduced growth was driven by a combination of multiple renewal transactions and two companies (Pathway Genomics and Regulus Therapeutics) that downsized operations—each decreasing its footprint by more than 30,000 square feet during the quarter.

Life sciences employment composition



Life sciences establishment composition



Torrey Pines & UTC

Facilities scorecard

Supply	Torrey Pines	UTC
Rentable lab stock	5.9 m.s.f.	3.9 m.s.f.
Owner-occupied lab stock	1.9 m.s.f.	0.2 m.s.f.
(% of total lab stock)	32.1%	21.2%
Total vacancy	5.2%	7.6%
(Change year-over-year)	+1.2 ppts	0.0 ppts
# of large blocks over 50,000 s.f.	8	3
Under construction (s.f.)	0 s.f.	286,862 s.f.
Demand		
# of requirements	5	6
Total s.f. requirements	120,000 s.f.	437,000 s.f.
Pricing		
Average asking rent (NNN)	$52.56 p.s.f.	$52.20 p.s.f.
(Change year-over-year)	+1.4%	+2.4%

Recent activity

Nitto Denko
10618 Science Center Drive
San Diego
59,248 s.f.
Class A

Signal Pharmaceuticals
4224 Campus Point Court
San Diego
35,203 s.f.
Class A

BioAtla
11085 Torreyana Road
San Diego
43,375 s.f.
Class B

Epic Sciences
9381 Judicial Drive
San Diego
44,036 s.f.
Class B

Activity key: **Leasing** **Sales** **Under construction**

Torrey Pines

Torrey Pines remains the tightest biotech submarket

- Torrey Pines led all submarkets in total square feet leased in Q1 2019, with a total of 164,529 square feet leased among six completed transactions.
- The submarket has no new recent speculative development; therefore, rental rates have remained steady, with deals signed with starting rates in the $45.50 to $52.00 NNN-per-square-foot range.
- Although Torrey Pines's vacancy rate keeps it as the tightest biotech submarket, the direct vacancy has seen the highest 12-month increase by 120 basis points. In addition, large-block options have quadrupled year-over-year, giving Torrey Pines the most options for spaces over 50,000 s.f. in the core biotech cluster. This is due to Scripps Research downsizing and Takeda relocating to UTC, giving back a total of 450,000 s.f. of space.

UTC

UTC is the fastest-growing life sciences submarket in San Diego

- In Q1 2019, two transactions were completed in UTC/Campus Point that produced 105,844 square feet of leasing volume.
- UTC/Campus Point leads the core biotech cluster with new ground-up development, with two projects totaling 286,862 square feet. The submarket has had the largest delivery of the year with a 163,469-square-foot build-to-suit for Takeda Pharmaceuticals' relocation/expansion from Torrey Pines.
- The new supply coming online and high demand have caused average asking rents for UTC/Campus Point to have a higher year-over-year rent growth than the adjacent Torrey Pines submarket.

Sorrento Mesa & Sorrento Valley

Facilities scorecard

Supply	Sorrento Mesa	Sorrento Valley
Rentable lab stock	4.4 m.s.f.	1.2 m.s.f.
Owner-occupied lab stock	1.3 m.s.f.	0.1 m.s.f.
(% of total lab stock)	23.9%	6.5%
Total vacancy	6.6%	6.4%
(Change year-over-year)	+0.3 ppts	-0.5 ppts
# of large blocks over 50,000 s.f.	4	0
Under construction (s.f.)	28,000 s.f.	0 s.f.
Demand		
# of requirements	11	5
Total s.f. requirements	465,000 s.f.	77,000 s.f.
Pricing		
Average asking rent (NNN)	$42.84 p.s.f.	$41.64 p.s.f.
(Change year-over-year)	+4.1%	+5.2%

Recent activity

Pathway Genomics
6777 Nancy Ridge Drive
San Diego
11,978 s.f.
Class B

Element Bio
10655 Sorrento Valley Road
San Diego
14,123 s.f.
Class B

Encodia
11125 Flintkote Ave.
San Diego
8,406 s.f.
Class A

San Diego Inspire
11558–11588 Sorrento Valley Road
San Diego
303,936 s.f.
$112M acquisition by Longfellow Partners

Activity key: **Leasing** **Sales** **Under construction**

Sorrento Mesa

Leasing activity strong over last 12 months, but sluggish Q1

- The Sorrento Mesa and Sorrento Valley submarkets recorded notable rent growth throughout 2018 to 2019. Sorrento Mesa's average asking rents have increased by 35 percent over the last five years.
- Over the last 12 months Sorrento Mesa has had robust biotech leasing, posting 30 deals totaling 716,254 square feet. This leasing activity included five transactions over 50,000 square feet.
- In Q1 2019, Sorrento Mesa saw activity decline sharply from Q4 2018, with three completed transactions that produced only 16,305 square feet of total leasing.

Sorrento Valley

Longfellow Partners increases Sorrento Valley portfolio

- Boston-based Longfellow Partners entered the San Diego biotech cluster in 2018. Over the last six months it has made two transactions and is currently looking to acquire more lab assets in Sorrento Valley. The first purchase included the Inspire portfolio totaling 303,936 square feet for $112 million, and the second included another 37,555 square feet for $15.5 million.
- Q1 2019 leasing for Sorrento Valley had a total of six transactions that together accounted for 34,218 square feet leased—with an average deal size of 5,703 square feet. Sorrento Valley remains true to incubator identity with small to midsize deal volume.
- With active sales transactions and a few conversion projects to lab, Sorrento Valley's rents led the biotech cluster with year-over-year asking rent premiums.

North County

Facilities scorecard

Supply	North County
Rentable lab stock	3.0 m.s.f.
Owner-occupied lab stock	0.8 m.s.f.
(% of total lab stock)	16.3%
Total vacancy	7.6%
(Change year-over-year)	+0.1 ppts
# of large blocks over 50,000 s.f.	1
Under construction (s.f.)	0 s.f.
Demand	
# of requirements	5
Total s.f. requirements	228,000 s.f.
Pricing	
Average asking rent (NNN)	$25.00 p.s.f.
(Change year-over-year)	+4.2%

Recent activity

Abbott Laboratories
2251 Faraday Ave.
Carlsbad
46,969 s.f.
Class A

Acadia Pharmaceuticals
12830 El Camino Real
San Diego
67,020 s.f.
Class A

eMolecules
3430 Carmel Mountain Road
San Diego
7,314 s.f.
Class A

VertuBio
2744 Loker Ave. W.
Carlsbad
4,380 s.f.
Class B

Activity key: **Leasing** **Sales** **Under construction**

North County

One available large block brings San Diego's North County vacancy up

- North County's vacancy rate of 7.6 percent marks the highest level seen in well over a decade, following the last peak in vacancy of 20.6 percent in mid-2007. The lab space continues to be extremely tight in the North County submarkets.
- The top large availability in the North County is the former Dart Neuroscience's 191,677-square-foot building in Scripps Ranch. Besides the former Dart Neurosciences building, the I-15 Corridor that includes the Scripps Ranch and Rancho Bernardo submarkets has very minimal lab inventory. The I-15 Corridor is primarily made of life sciences companies that mostly occupy office and need minimal lab space compared to the core biotech cluster submarkets.
- The majority of the North County 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 and Genentech.
- There are no specific life sciences projects currently under construction, but 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.
- Another emerging life sciences submarket located north of the core cluster is Del Mar Heights. 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. Since 2017, the submarket has seen a total of 20 deals totaling 400,000 s.f. of leasing. This is fully made up of traditional office space, with no wet lab component.

Seattle/Puget Sound

Demand from life sciences companies in the Puget Sound has led to a lack of supply. Vacancy across the region sits at just 4.1 percent through Q1 2019.

Seattle's life sciences market is poised for future growth thanks to a well-established core of highly educated tech and medical talent that will continue to expand because of a strong local education system.

Seattle/Puget Sound

While the Puget Sound life sciences market is smaller than other major markets nationally, it's growing faster than the rest of the country. In terms of life sciences employment growth, the greater Seattle area has grown faster than any other major market in recent years. This growth has been fueled by strong workforce gains as a result of proximity to highly ranked medical institutions—led by the University of Washington, which ranks 11th on the list of top NIH-funded schools. Seattle's rise in life sciences prominence has further fueled demand for lab space in the market.

Lake Union

Lake Union is the center of the Seattle life sciences market, offering a wide variety of incubator-style life sciences labs along with significant institutional research centers such as Fred Hutch and the University of Washington. Alexandria Real Estate's The Atrium is scheduled to deliver 205,000 square feet of life sciences space to the market by Q2 2019. With major leases signed in Q1, only 32.8 percent of The Atrium remains available. With 857,000 square feet of long-term proposed projects, Lake Union will continue to be the focus of the Puget Sound life sciences market.

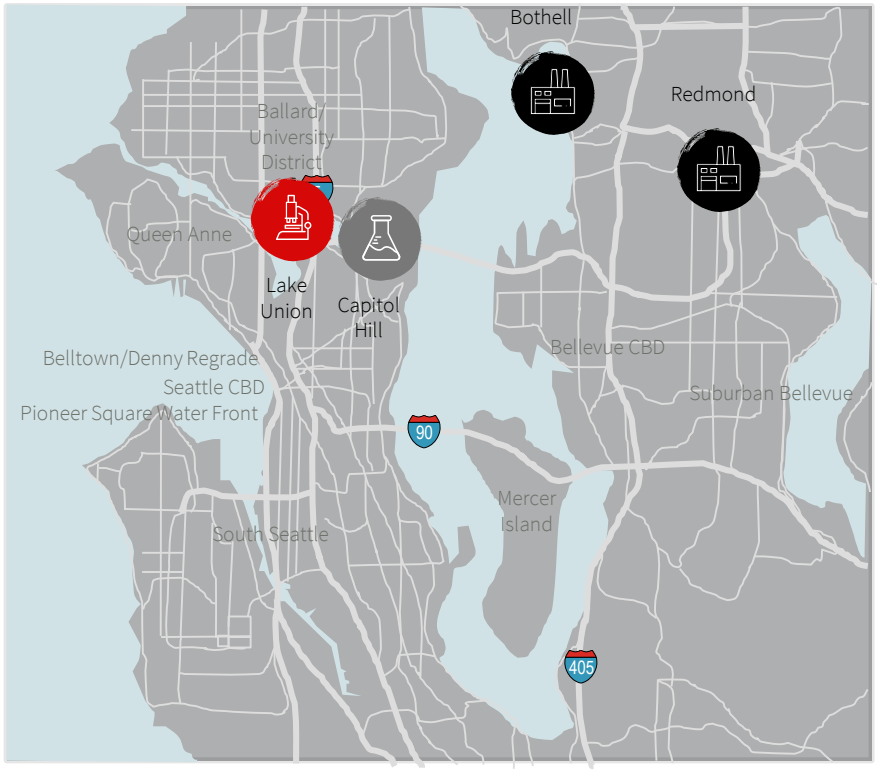
Bothell

Bothell is the second-largest life sciences submarket in Seattle, with 2.1 million square feet of inventory spread between its two core areas of Canyon Park and North Creek. Overall vacancy in Bothell ticked up slightly over the past 12 months to the current rate of 14.6 percent. While Lake Union has served as a focus for life sciences companies in the Puget Sound, Bothell has been a focus of many firms looking to expand in the region or those tenants considering a more cost-effective alternative to space in the Lake Union area.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 49.9

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	26,209	1.8%	3.4%
Establishments	985	0.9%	-2.9%

Funding	Total life sciences	% to total U.S.
VC funding	$248.8M	1.2%
NIH funding	$935.3M	3.3%

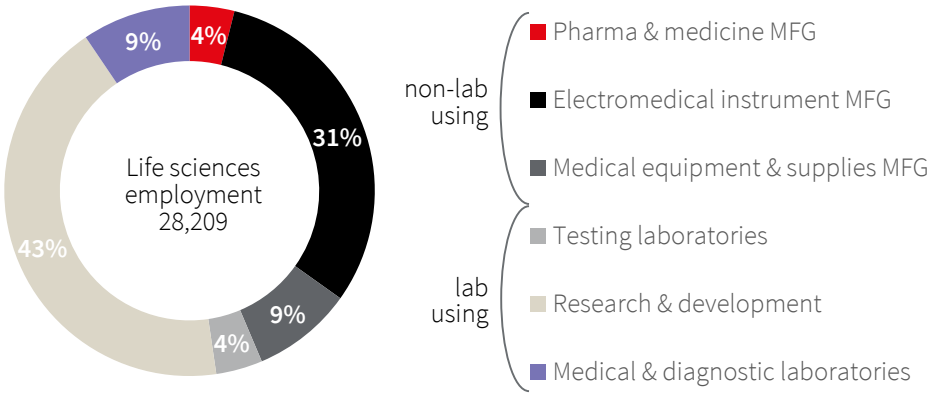
Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	10.0 m.s.f.	4.1%	$30.65 p.s.f.

The Puget Sound is home to many large life sciences companies, including the Bill & Melinda Gates Foundation, Allen Institute, Fred Hutch Cancer Research Center, Seattle Genetics and Seattle Children's Research Institute. The region continues to see growth in R&D and innovation around bio-technology and healthcare that have helped position Seattle/Puget Sound market as a top destination for not only real estate investment but also job growth.

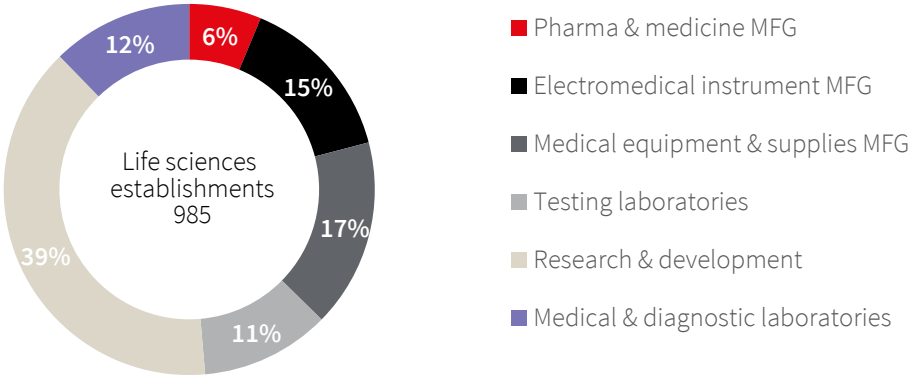
Following strong levels of merger and acquisition activity over the past few years, the life sciences industry is poised for another year of deal-making in 2019. Bristol-Myers Squibb is in the process of acquiring Celgene, the parent company of Juno Therapeutics, in a $74 million cash and stock buyout deal. Also, German-based biotech company Evotec recently acquired Gates Foundation–backed Just Biotherapeutics, a Seattle-based startup that aims to develop low-cost protein drugs, for $90 million.

Positive momentum for life sciences in the region is also evidenced by recent job growth and venture capital funding. A recent report released by Life Science Washington shows that life sciences jobs increased 13.0 percent from 2014 to 2017, after dropping 3.0 percent between 2011 to 2014. This growth is primarily fueled by an emerging generation of startup companies. In 2019, the Seattle-based biotech startup Good Therapeutics raised $11 million and Immusoft closed a $20 million venture capital deal.

Life sciences employment composition



Life sciences establishment composition



Seattle

Facilities scorecard

Supply	Lake Union
Rentable lab stock	2.0 m.s.f.
Owner-occupied lab stock	1.7 m.s.f.
(% of total lab stock)	37.7%
Total vacancy	1.0%
(Change year-over-year)	-0.4 bps
# of large blocks over 50,000 s.f.	0
Under construction (s.f.)	0.2 m.s.f.
Demand	
# of requirements	6
Total s.f. requirements	300,000 s.f.
Pricing	
Average asking rent (NNN)	$49.87
(Change year-over-year)	3.8%

Recent activity

Sana Biotechnology
188 E. Blaine St.
Seattle
32,830 s.f.
Class A

The Atrium
188 E. Blaine St.
Seattle
205,000 s.f.
Q2 2019 completion

Ignite Biosciences
425 Pontius Ave. N.
Seattle
2,542 s.f.
Class B

Lake Union Uplands
1600 Fairview Ave. E.
Seattle
12,727 s.f.
Class B

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

Mini market

Developers remain bullish on Lake Union

- Lake Union's vacancy rate currently sits at 1.0 percent, which is by far the lowest vacancy rate among the submarkets in the Seattle/Puget Sound region. These tight market conditions, along with high costs, create challenges for life sciences companies, particularly startups, in finding the right space.
- Alexandria Real Estate's The Atrium is scheduled for completion in Q2 2019. The project will deliver 205,000 square feet of life sciences space and is now 71 percent preleased. In Q1, Sana Biotechnology signed over 32,000 square feet, joining bluebird bio and Seattle Cancer Care Alliance in the building.
- Given strong demand for life sciences and office space in Seattle, developers and life sciences companies are moving forward with proposed projects or expansion plans. Alexandria Real Estate has three proposed projects in Lake Union that are likely to be delivered in the next 2–3 years.
- Seattle Cancer Care Alliance (SCCA) also has plans to expand in Lake Union. The proposed project will add 240,000 of office and lab spaces to its existing building and will bring its total footprint to nearly 500,000 square feet.
- Fred Hutch Cancer Research Center accounts for 1.6 million square feet of institutionally owned lab space in Lake Union. Later this year, the company plans to occupy 106,000 square feet at the former ZymoGenetics Steam Plant, which it signed a 10-year full-building lease for in 2018.
- Seattle Children's Research Institute's new research center in the Seattle CBD is currently under construction and will be completed in 2019. This 13-story research facility will deliver 540,000 square feet of research and office space. The center will focus on researching immunotherapy treatments.

Suburban

Facilities scorecard

Supply	Bothell
Rentable lab stock	1.6 m.s.f.
Owner-occupied lab stock	0.5 m.s.f.
(% of total lab stock)	22.5%
Total vacancy	14.2%
(Change year-over-year)	+0.8 bps
# of large blocks over 50,000 s.f.	3
Under construction (s.f.)	0 s.f.
Demand	
# of requirements	9
Total s.f. requirements	312,000 s.f.
Pricing	
Average asking rent (NNN)	$23.06
(Change year-over-year)	3.3%

Recent activity

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

Nanostring Technologies
3830 Monte Villa Parkway
Bothell
29,758 s.f.
Class A
New

Seattle Genetics
2300–2530 223rd St. SE
Bothell
207,000 s.f.
Class B
New

Nexus Research Center
21720 23rd Drive SE
Bothell
66,568 s.f.
Class A

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

Mini market

Demand for space is outpacing supply in Bothell

- Nanostring Technologies, headquartered in Seattle, recently expanded in Bothell. The company signed a new lease for approximately 30,000 square feet at 3830 Monte Villa Building for 10 years and will occupy the space in Q4 2019.
- Bothell-based Seattle Genetics, the largest biotech company in Washington, has expanded in order to accommodate its growth. In late 2018, the company signed new leases for 207,000 square feet across three buildings at Canyon Park Commons I, II and III, bringing its total office/industrial footprint in the submarket to more than 600,000 square feet. In Q1 2019, Seattle Genetics renewed 61,094 square feet at Highlands Campus Tech Centre for 10 years.
- After a $511 million merger in 2017 between Tokyo-based AGC Asahi Glass and CMC Biologics, AGC Biologics announced its addition of a new building complex in Bothell. This former Amgen facility will provide additional space for manufacturing capacity. The company has invested significant capital to improve its lab space and has more than doubled its footprint in the submarket since the acquisition.
- With nearly 312,000 square feet of active life sciences requirements and limited available spaces in virtually every other submarkets on the Eastside, Bothell will continue to be a viable and economical solution for both smaller and more established life sciences companies.
- While there are no life-sciences-specific projects currently under construction or planned in the near future, there are nine life sciences companies actively touring the market to meet their real estate needs. Conversely, there are currently just two blocks of space over 40,000 square feet available at Nexus Research Center and Canyon Park East.

San Francisco Bay Area

The San Francisco Bay Area is the birthplace of biotechnology, growing into a leading life sciences market. The area has been ripe for growth since the founding of Genentech in conjunction with a concentration of funding.

Acclaimed universities in the area are a vital source of talented graduates, also providing advanced technologies and scientific discoveries, establishing a hotbed for innovation among companies and startups.

San Francisco Mid-Peninsula

The Mid-Peninsula is the birthplace of genetics engineering that began with Genentech more than four decades ago. Today the largest players in the life sciences industry, including Roche (Genentech), Gilead, Illumina, Merck, Amgen, Abbvie and Verily have established a foothold in the area, which boasts one of the densest concentration of highly qualified life sciences professionals.

East Bay

The East Bay is home to anchor research institutions, prestigious universities and major healthcare companies like Novartis and Bayer Healthcare. The Oakland Enterprise Zone was established in 1993 to revitalize the business area by offering tax incentives. The creation of the Enterprise Zone led to the emergence of Berkeley and Emeryville, which today represent two of the largest life sciences markets in the Bay Area.

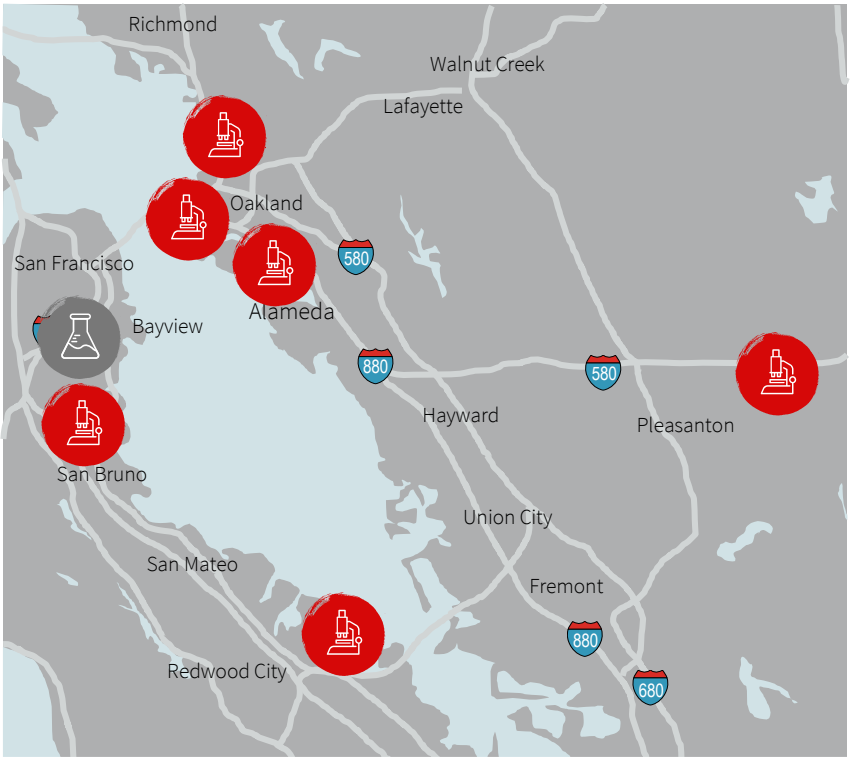
Mission Bay

Mission Bay has a relatively smaller life sciences cluster. The region is home to major life sciences tenants such as Medivation, Illumina and Clovis Oncology. San Francisco's prestigious UCSF attracts talent from around the world, further enhancing a well-educated labor pool. Recently, technology companies have also begun to look at opportunities in Mission Bay.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 81.6

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	79,525	4.0%	7.0%
Establishments	1,710	1.0%	0.1%

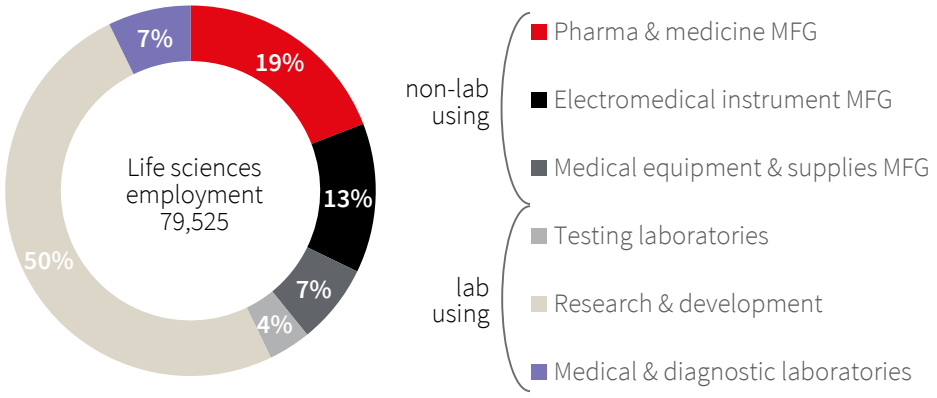
Funding	Total life sciences	% to total U.S.
VC funding	$5,724M	28.5%
NIH funding	$1,050M	3.7%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	20.8 m.s.f.	3.8%	$49.21 p.s.f.

The local concentration of major research universities, teaching hospitals, scientific research institutions and life sciences industry companies have established a critical mass of scientific research professionals to fuel innovation and growth. Researchers from local academic institutions also attract billions of dollars in grants from the National Institutes of Health (NIH) and other organizations. Stanford University, UC Berkeley and UC San Francisco were granted a combined $1.3 billion in 2018 alone.

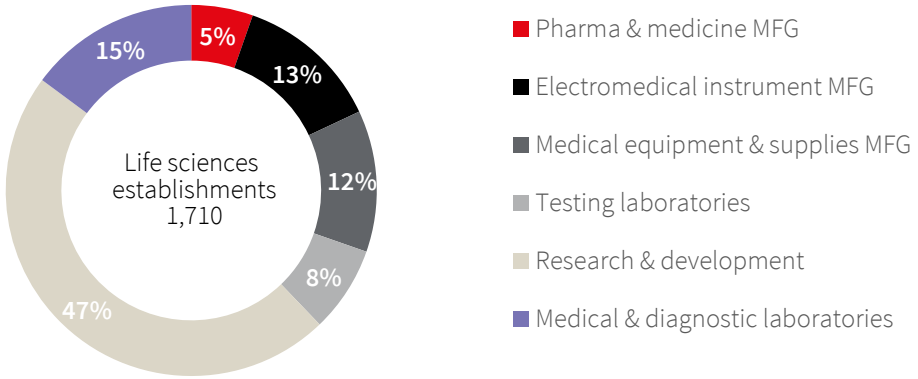
The Bay Area continues to be a powerhouse in venture capital funding. In particular, biotech, pharmaceutical and medical device companies in San Francisco and the Silicon Valley attracted $5.6 billion in venture capital in 2018, representing about 28.5 percent of the total nationally for these industries. Unemployment in the area fell to 2.0 percent in April, telling of the ensuing scarcity of talent.

Life sciences employment composition



Several of the largest and most successful biotechnology companies are based in the Bay Area, even after some have been acquired by big pharma companies. Roche took full ownership of Genentech in 2009 and maintains operations in South San Francisco. Additionally, Chiron Corporation, founded in 1981, was acquired by Novartis in 2006. Even companies like San Diego–based Illumina (ILMN) have established significant operations in the Bay Area to tap local talent.

Life sciences establishment composition



Mid-Peninsula

Facilities scorecard

Supply	**North County**	**South County**
Rentable lab stock	7.0 m.s.f.	3.4 m.s.f.
Owner-occupied lab stock	3.1 m.s.f.	0 s.f.
(% of total lab stock)	44.3%	0%
Total vacancy	3.4%	1.9%
(Change year-over-year)	+0.5 ppts	+0.3 ppts
# of large blocks over 50,000 s.f.	1	0
Under construction (s.f.)	3,346,298 s.f.	25,000 s.f.
Demand		
# of requirements	23	11
Total s.f. requirements	3,070,000 s.f.	410,000 s.f.
Pricing		
Average asking rent (NNN)	$57.12 p.s.f.	$59.04 p.s.f.
(Change year-over-year)	-2.6%	+10.3%

Recent activity

Abbvie
1000 Gateway Blvd.
South San Francisco
479,000 s.f.
Class A

Myokardia
1000 Sierra Point Parkway
Brisbane
129,846 s.f.
Class A

Celgene
1200 Sierra Point Parkway
Brisbane
92,096 s.f.
Class A

Unity Biotechnology
285 E. Grand Ave.
South San Francisco
62,655 s.f.
Class A

Activity key: **Leasing** **Sales** **Under construction**

North County

Large-block availabilities dwindle

- Sustained, strong life sciences funding in the past two years has enabled many companies to swiftly enter growth phases.
- The amount of square footage under development has ramped up significantly, with the large players such as Abbvie signing preleases, keeping landlords and development companies optimistic.
- As premium Class A space is never on the market for very long, rents are subdued by second-generation space being more readily available in the market.

South County

Tech office demand spreads life sciences requirements farther

- Apart from a few small projects in the eastern end of Menlo Park, lab supply is not expected to grow significantly.
- Once it is closer to completion, Alexandria's District development in San Carlos will garner widespread attention, though it is also likely that technology companies will opportunistically compete.
- Vacancy rates in the area should continue to stay below 2.0 percent, as demand is as heated as ever.

San Francisco

Facilities scorecard

Supply	**San Francisco**
Rentable lab stock	1.1 m.s.f.
Owner-occupied lab stock	375,079 s.f.
(% of total lab stock)	26%
Total vacancy	0%
(Change year-over-year)	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)	$60–$70 p.s.f.
(Change year-over-year)	0%

Recent activity

Activity key: **Leasing** **Sales** **Under construction**

Mission Bay/China Basin

Short supply redirects demand south

- San Francisco's life sciences inventory remains concentrated in the Mission Bay/China Basin submarket and is relatively stable. With very limited supply, vacancy is still at 0.0 percent in the submarket.
- Projects eventually leased by Dropbox and Uber were initially thought to add more life sciences inventory to the market. While those projects are nearing completion, there have not been many talks of new life sciences projects as tech tenant demand continues on a tear.
- Bristol-Myers Squibb's acquisition of Celgene may result in more consolidation, possibly opening up around 50,000 square feet in the area, though its neighbor UCSF can potentially take over its space.

East Bay

Facilities scorecard

Supply	**Major lab**	**Emerging lab**
Rentable lab stock	4.7 m.s.f.	3.2 m.s.f.
Owner occupied lab stock	994,000 s.f.	325,000 s.f.
(% of total lab stock)	21.2%	10.1%
Total vacancy	8.1%	3.6%
(Change year-over-year)	-3.5 ppts	-8.0 ppts
# of large blocks over 50,000 s.f.	1	1
Under construction (s.f.)	0 s.f.	0 s.f.
Demand		
# of requirements	7	3
Total s.f. requirements	280,000 s.f.	67,000 s.f.
Pricing		
Average asking rent (NNN)		
(Change year-over-year)		
Oakland Metro	$63.00 p.s.f.	$45.00 p.s.f.
	23.5%	25.0%
Tri-Valley	$25.00 p.s.f.	N/A
	23.5%	

Recent activity

Novartis
5959 Horton St.
Emeryville
62,144 s.f.
Class A

Gritstone Oncology
5959 Horton St.
Emeryville
34,469 s.f.
Class A

Dynavax Technologies
5959 Horton St.
Emeryville
75,662 s.f.
Class A

Emeryville Center for Innovation
5300 Chiron Way
Emeryville
250,000 s.f.
Class B

Activity key: **Leasing** **Sales** **Under construction**

Oakland Metro

Steady VC funding strengthens life sciences confidence

- Berkeley and Emeryville continue to be Oakland Metro's primary life sciences hub, where venture capitalists have been investing in the area at a steadfast pace. In 2018, VC funding totaled just over $2.2 billion, up 56.1 percent since 2017.
- The area is anchored by notable companies like Zymergen, Inc., Aduro Biotech and Bayer Health. In 2018, Zymergen, Inc. received $400.0 million in VC funding and accounted for the majority of funds in Oakland Metro.
- Supply is limited, where vacancy sits at 6.7 percent, inclusive of Alameda and Richmond. No new lab construction is under way, and some landlords are considering converting existing offices to lab/R&D space.

Tri-Valley

95.3% of lab space is occupied

- The Tri-Valley has served as one of the largest innovation hubs in the East Bay, anchored by Lawrence Livermore National Labs, 10X Genomics, Unchained Labs and Roche Molecular Systems, to name a few.
- The area has had a steady flow of venture capital funding for life sciences companies, allowing companies to expand operations and/or increase productivity. Additionally, the presence of life science startups and incubators has strengthened, ranging from biotechnology to medical device technology companies.

Suburban MD

Tenant demand remains strong, totaling over 1 m.s.f. over the past three years with more than 400,000 s.f. of move-ins pending.

Developers have responded to escalating demand within the market to create new opportunities through the development pipeline for the first time in this market cycle.

I-270

Shady Grove and Gaithersburg, the epicenter of the I-270 lab market, have accounted for the majority of tenant activity in the market, thus keeping fundamentals very tight.

With vacancy hovering around 5 percent and pending tenant move-ins totaling more than 400,000 s.f., developers have responded with new development and office- and flex-conversion opportunities.

Most recently, 704 Quince Orchard delivered as a speculative conversion of a 1980s-constructed office building. Additionally, over the past year several tenants have signed leases for Class A build-to-suit developments that are expected to begin delivering later in 2019 and through 2021. Finally, spurred along by the aforementioned demand paradigm, a landlord recently began offering a 280,000-s.f. existing office complex as a lab conversion opportunity, anchored by the newly signed Supernus Pharmaceuticals lease.

Bethesda CBD

As leasing momentum builds along the I-270 Corridor, developers are beginning to investigate the feasibility of lab product elsewhere in Suburban Maryland. A new 175,000-s.f. speculative development in Bethesda is expected to break ground this year. The development, by Donohoe Companies and StonebridgeCarras, will be Suburban Maryland's first urban life sciences development. With the development being the only option in the market with urban amenities and Metro access, rents are understandably the highest in the market at an asking rent of $50 p.s.f. NNN, nearly a 20 percent premium to northern peers. With the majority of the lab market focused in the north suburbs outside of the true urban environment, the county has begun to analyze incentive structures to create a potential urban lab offering, with a potential focus on the eastern side of the Red Line, located in Silver Spring.

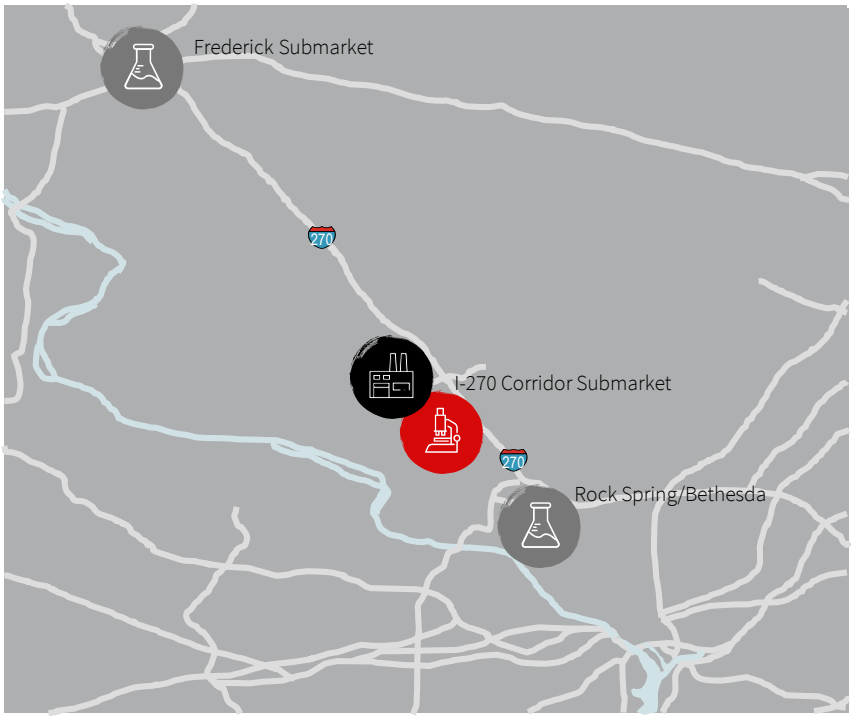
Frederick County

As large blocks of availability and large tracts of land remain scarce in Montgomery County, large users, particularly manufacturing users, are eyeing opportunities in Frederick County. Kite Pharma recently purchased 20 acres in the Frederick County and plans to develop a new 280,000-s.f. R&D, manufacturing and distribution facility. Kite Pharma will join MedImmune and Thermo Fisher, which also have large facilities in Frederick County.

Major lab supply:
Clusters of established lab stock with long-time industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 52.5

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	40,516	2.2%	-2.0%
Establishments	1,640	1.2%	-3.0%

Funding	Total life sciences	% to total U.S.
VC funding	$554.1M	2.8%
NIH funding	$607.2M	2.2%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	10.3 m.s.f.	5.3%	$25.56 p.s.f.

The Suburban Maryland cluster is home to three very distinctive government institutions—the National Institutes of Health (NIH), National Institute of Standards and Technology (NIST) and the U.S. Food and Drug Administration (FDA). The area is closely tied to several universities, including the University of Maryland and Johns Hopkins University.

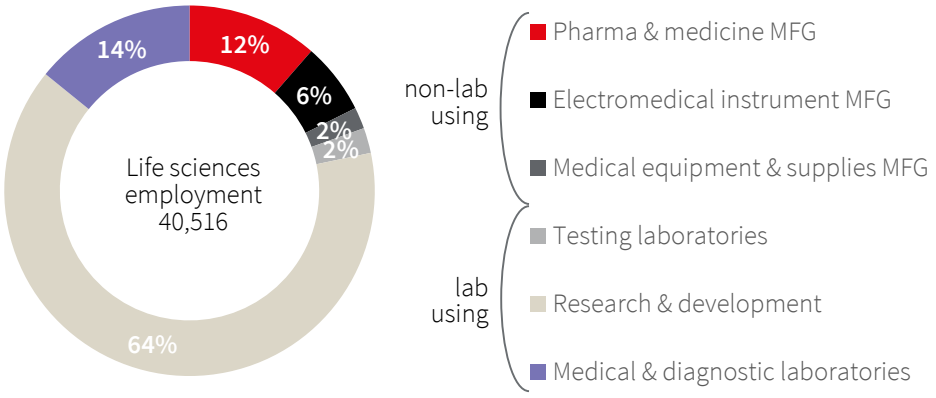
Arguably the most impactful presence in Suburban Maryland, the NIH provided over $600M in funding to private-sector firms in Maryland in 2018, on top of over $900M in funding to major universities.

Notable recipients of major NIH funding include Leidos Biomedical, Emmes and the Henry M. Jackson Foundation. Additionally, several Maryland life sciences firms received early-stage venture sums exceeding $5M over the past year—Neuraly, Vigene Biosciences, Insilico Medicine and BioFactura. Since July 1, 2018, Suburban Maryland firms have hauled in almost $300M in private funding.

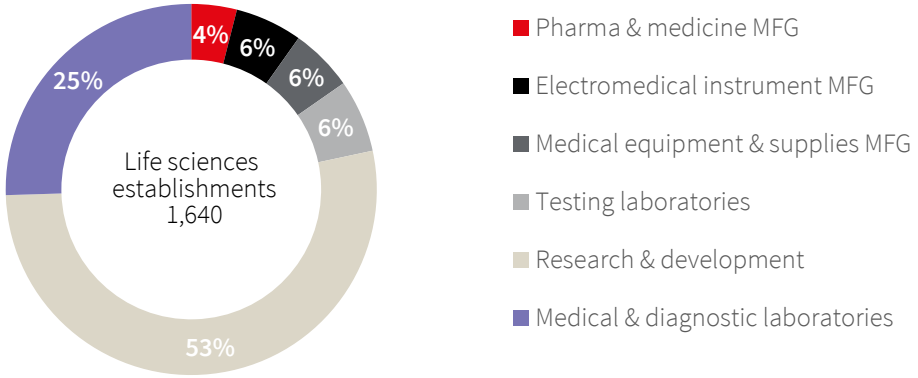
Suburban Maryland also boasts major facilities for industry giants such as GlaxoSmithKline, AstraZeneca's MedImmune, Thermo Fisher Scientific and Kite Pharma that provide a strong base to the region's life sciences employment.

The majority of Suburban Maryland's life sciences workforce is involved in R&D with a significant employment base in pharmaceutical and medical manufacturing. Several recent leases were signed for pharmaceutical manufacturing facilities.

Life sciences employment composition



Life sciences establishment composition



Suburban MD

Facilities scorecard

Supply	I-270	Frederick
Rentable lab stock	8.4 m.s.f.	1.1 m.s.f.
Owner-occupied lab stock	1.8 m.s.f.	615,000 s.f.
(% of total lab stock)	81.5%	9.7%
Total vacancy	5.2%	1.0%
(Change year-over-year)	-0.1 ppts	-1.1 ppts
# of large blocks over 50,000 s.f.	1	0
Under construction (s.f.)	437,409 s.f.	0 s.f.
Demand		
# of requirements	8	
Total s.f. requirements	496,000 s.f.	
Pricing		
Average asking rent (NNN)	$28.24 p.s.f.	$20.00 p.s.f.
(Change year-over-year)	+8.1%	+10.0%

Recent activity

Autolus
9950 Medical Center Drive
Rockville
85,000 s.f.
Class A

REGENXBIO
9800 Medical Center Drive
Rockville
132,000 s.f.
Class A

Supernus Pharmaceuticals
9715–9717 Key West Ave.
Rockville
136,000 s.f.
Class A

Kite Pharma
9021 Bennett Creek Blvd.
Frederick
20 acres

Activity key: **Leasing** **Sales** **Under construction**

Shady Grove

New developments land anchor tenants

- Autolus Therapeutics and REGENXBIO signed build-to-suit leases in Shady Grove this year totaling more than 200,000 s.f. As of the midpoint of 2019, both developments are under way and projected to deliver by 2021. Alexandria Real Estate Equities is the owner-developer of both sites.
- Rents in Shady Grove have pushed comfortably into the $30s p.s.f. NNN, with new construction space approaching $40.00 p.s.f. NNN.
- Supernus Pharmaceuticals signed a lease for 136,000 s.f. of office and lab space at 9715 and 9717 Key West Avenue. Remaining spaces in those two buildings and the third in the office park, 9713 Key West Ave., are now being marketed as a conversion opportunities for life sciences tenants.

Frederick

Large users and home-grown firms drive activity

- Kite Pharma recently purchased a 20-acre plot to build a new 280,000-s.f. facility. The final purchase was for $7.5M in Urbana, Maryland. Ultimately, the new facility is expected to house R&D, manufacturing, distribution and office uses.
- RoosterBio and Akonni Biosystems, both of which emerged from the Frederick Innovative Technology Center, continue to be mainstays in the market.
- Alongside those two home-grown tenants, major life sciences firms have a significant presence. MedImmune and Thermo Fisher have large facilities.

Greater Toronto

The Greater Toronto Area (GTA) is home to Canada's largest life sciences cluster. It is also home to Canada's most concentrated life sciences research node: the Discovery District located on the northeastern edge of downtown Toronto. Outside of Toronto, McMaster Innovation Park in Hamilton and IBM Innovation space in Markham are both emerging Innovation hubs supporting startup companies.

Downtown Toronto–Discovery District

Toronto's Discovery District is a concentrated life sciences cluster located in the heart of the downtown core. It's a 2.5-square-kilometer research park and health innovation hub. The Discovery District is home to the University of Toronto, Ryerson University, the MaRS Centre and four top Canadian research hospitals: Toronto General, St. Michael's, Mount Sinai and Hospital for Sick Kids. Over the last decade, the MaRS ecosystem enhanced the Canadian economy by helping thousands of startup companies to grow and create jobs.

Mississauga

Mississauga is the largest life sciences cluster in the suburban Greater Toronto Area, located to the west of the City of Toronto. The city is home to a dynamic cluster of life sciences/pharmaceuticals companies largely located in the Meadowvale Business Park Corporate Centre and the Sheridan Business Park. The city is also committed to elevating its life sciences industry on the global stage, with goals of creating an innovation district to support early-stage companies looking to commercialize, grow and mature.

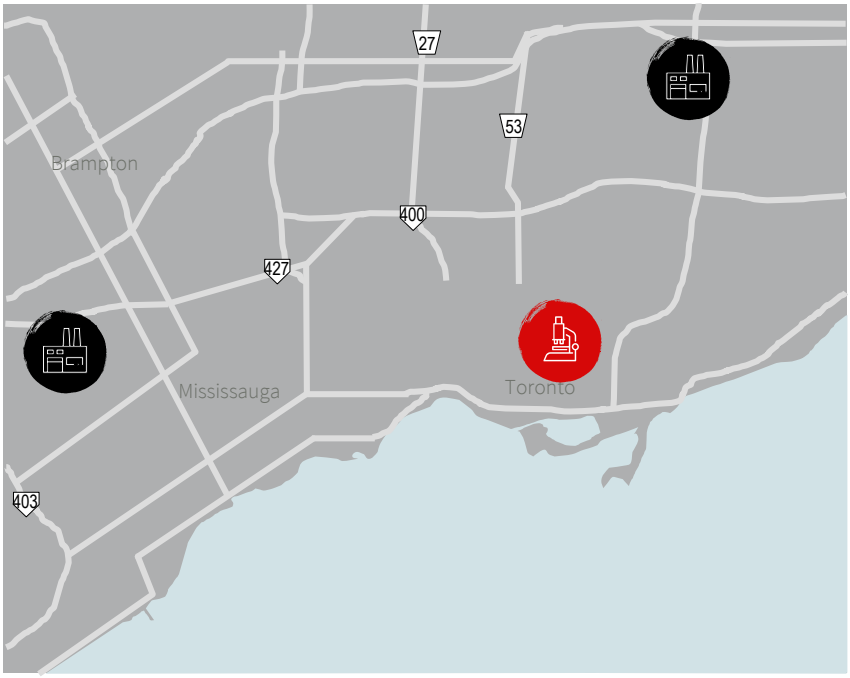
Markham

Located just north of the City of Toronto, Markham is a vibrant technology hub currently looking to leverage its strength in high technology and software development to grow its life sciences sector. The IBM Innovation space is a 50,000-square-foot innovation hub, located in the IBM Canada's headquarters, that serve as an incubator for many startup companies to mature and sustain. Sanofi, a large scaled pharmaceutical company, has also expanded its Canadian footprint with a $500 million investment in a new vaccine manufacturing plant.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	37,575	1.1%	3.8%
Establishments	2,835	0.9%	16.6%

Funding	Total life sciences	% to total Canada
VC funding	$40.9M	13.6%

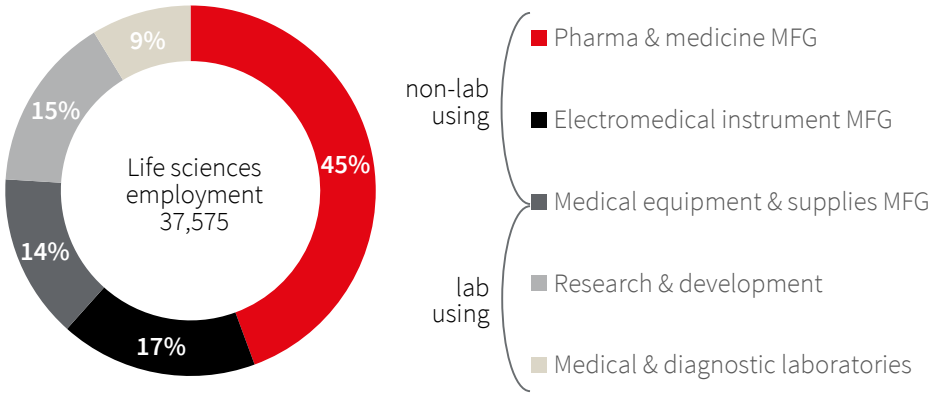
Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	3.47 m.s.f.	0.2%	$19.54 p.s.f.

The Greater Toronto Area's lab space inventory increased by 90,000 square feet since last year. The majority of lab inventory is owner-occupied and located in the Discovery District.

Over the past year employment in the life sciences sector increased by 3.8 percent, with the majority of jobs found in non-lab-using professions.

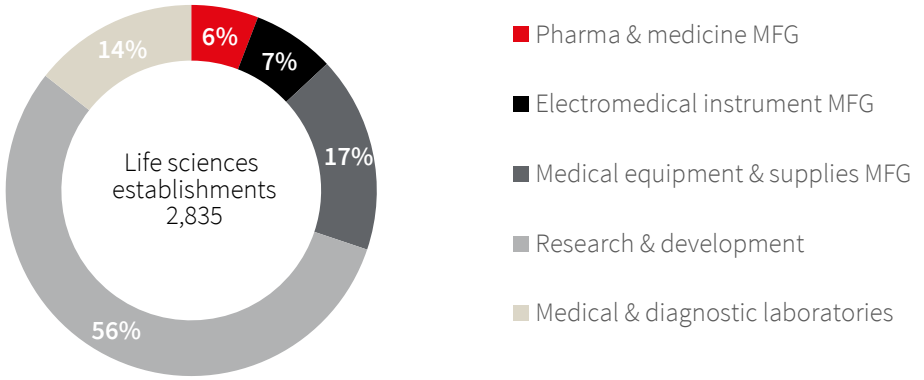
The top global pharmaceutical companies including Roche, Johnson & Johnson and GlaxoSmithKline account for the majority of employment share in the life sciences sector. These large multinational enterprises focus on sales, marketing, clinical trials, operation support and manufacturing in the GTA. The research and development segment is a relatively small but growing sector which is poised for future growth.

Life sciences employment composition



Both the R&D and the medical equipment and supplies sector have benefited from VC funding in past years, which promoted significant growth of small startups throughout the GTA. However, VC funding saw a significant pullback in 2018, which will likely impact growth in the short term.

Life sciences establishment composition



Toronto/Mississauga

Facilities scorecard

Supply	Discovery District	Mississauga
Rentable lab stock	1.4 m.s.f.	547,120 s.f.
Owner-occupied lab stock	1.4 m.s.f.	131,600 s.f.
(% of total lab stock)	80.5%	19.5%
Total vacancy	0.0%	1.8%
(Change year-over-year)	0.0 ppts	80 ppts
# of large blocks over 50,000 s.f.	0	0
Under construction (s.f.)	0 s.f.	0 s.f.
Demand		
# of requirements	0	0
Total s.f. requirements	0 s.f.	0 s.f.
Pricing		
Average asking rent (NNN)	$32.67 p.s.f.	$16.26 p.s.f.
(Change year-over-year)	9.8%	0.3%

Recent activity

Local Health Integration Network
2695 North Sheridan Way
Mississauga
25,000 s.f.
Class A

Canadian Heart Research Centre
259 Yorkland Road
North York
28,000 s.f.
Class B

Think Research
25 Ontario St.–The Shift
Downtown Toronto
88,000 s.f.
Class A

MaRS Discovery District
125 Queens Quays E–The Hive
Downtown Toronto
24,000 s.f.
Class A

Activity key: **Leasing** **Sales** **Under construction**

Discovery District (Downtown Toronto)

MaRS is expanding its footprint

- Toronto's Discovery District continues to experience a tight office rental market, with Q1 2019 office vacancy reaching 2.4 percent.
- MaRS has expanded its footprint by leasing 24,000 square feet of office space in Waterfront Innovation Centre at 125 Queens Quay East. The new development will be delivered in the spring of 2021.
- Think Research has also expanded its footprint by finalizing a lease agreement for 88,000 square feet of office space at 25 Ontario St. East in downtown Toronto. It will serve as its new headquarters.
- A 750,000-square-foot Schwartz Reisman Innovation Centre is proposed at the northeast corner of College and Queen's Park. The Centre will have two towers, one of which will be 500,000 square feet and house laboratories for regenerative medicine, genetics and precision medicine. The construction is expected to start in the fall of 2019.

Mississauga

New Innovation Centre expected to create further jobs

- The Government of Ontario, in line with its initiative to strengthen the life sciences sector, has funded $18 million to the Baylis Medical Company to open a state-of-the-art Baylis Medical Innovation Centre in Mississauga.
- With very limited lab vacancy and no new lab construction in the pipeline, the new proposed Baylis Medical Innovation Centre will act as a catalyst for new startup companies to grow and establish themselves.
- On the lease renewal side, Inception Bioscience Inc. and Mississauga Halton Local Health Integration Network have recently renewed their spaces.

Westchester County

Through its proximity to NYC and research institutions, Westchester County has positioned itself as a biotech hub for major life sciences companies and startups in NY.

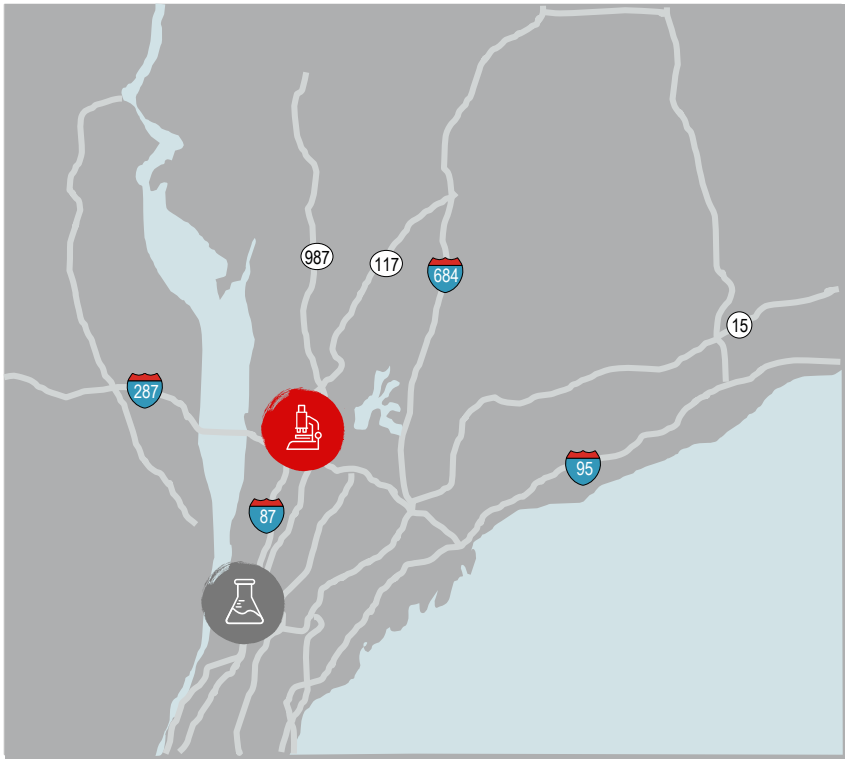
The $1.2 billion proposed biotech development project at North 60 in Valhalla is projected to create 8,000 jobs, which will fuel the life sciences landscape further.

Westchester County
With its proximity to major research institutions as well as easy access to New York City, Westchester County has cemented itself as a biotech hub in 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. Over the past decade, major key life sciences players have looked to expand their portfolio. Tarrytown-based Regeron Pharmaceuticals stands as the state's largest biotech company, employing more than 5,000 employees. The company occupies nearly 1.5 million square feet of space in Westchester County upon their recent expansion at 1 Rockwood Road in Sleepy Hollow. Also driving economic growth is Acorda Therapeutics, which employs nearly 500 professionals. Headquartered in Ardsley, the biotech company develops therapies that improve neurological function in people with Parkinson's disease, multiple sclerosis and other neurological disorders. There is also potential for 500,000 square feet of future redevelopment that could accommodate multiple tenants at Ardsley Park.

Major lab supply:
Clusters of established lab stock with longtime industry presence

Emerging lab supply:
Areas with limited lab stock today that are poised for growth

Life sciences manufacturing supply:
Clusters of manufacturing space devoted to pharmaceutical, biological or medical device and instrument manufacturing



Economic Scorecard

Cluster score: 27.4

Workforce	Total life sciences	% life sciences to private employment	Year-over-year growth
Employment	8,125	2.2%	-0.8%
Establishments	189	0.5%	-7.4%

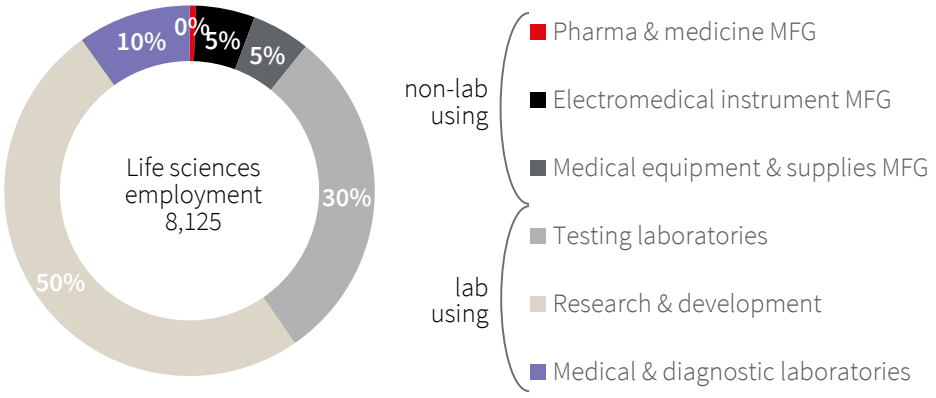
Funding	Total life sciences	% to total U.S.
VC funding	$0.0M	0.0%
NIH funding	$28.9M	0.1%

Inventory	Total supply	% Total vacancy	Average asking rent (NNN)
	3.13 m.s.f.	8.8%	$25.00 p.s.f.

Lab supply for biomedical companies remains scarce throughout the Westchester County, reporting a vacancy rate of 8.8 percent. The highly specialized nature of a life sciences tenant's build-out further limits space options.

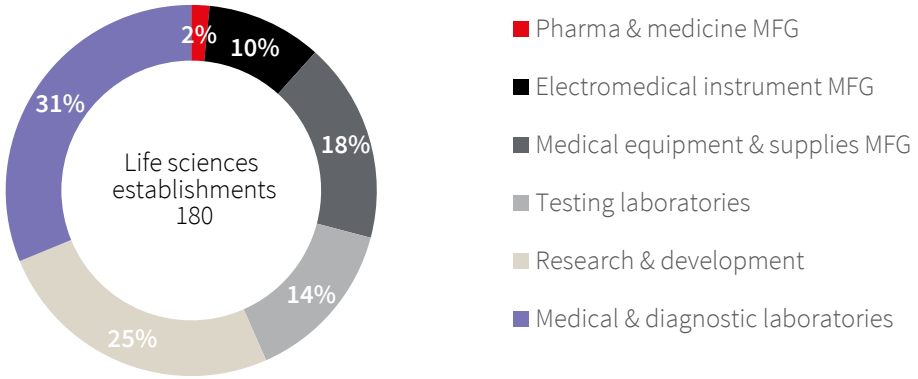
Employment is expected to increase once the North 60 project comes to fruition, as it is projected to create 8,000 permanent new jobs. Moreover, Regeneron and Acorda Therapeutics continue to expand their footprint within the market.

Life sciences employment composition



While vacancy within R&D centers remains low, new construction on the horizon could double life sciences establishments. Medical and diagnostic laboratories make up one-third of life sciences establishments in Westchester.

Life sciences establishment composition



Westchester County

Facilities scorecard

Supply	I-287 Corridor
Rentable lab stock	0.7 m.s.f.
Owner-occupied lab stock	2.4 m.s.f.
(% of total lab stock)	100%
Total vacancy	8.8%
(Change year-over-year)	-8.0 ppts
# of large blocks over 50,000 s.f.	3
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)	+0.00%

Recent activity

George Latimer
North 60
Valhalla
60 Acres
Class A

Ardsley Park
430 & 440 Saw Mill River Road
Ardsley
90,000 s.f.
Class A

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

I-287 Corridor

Proposed bioscience center hub gets 99-year lease

- George Latimer signed a 99-year lease at the proposed 60-acre biotech and medical technology hub at North 60 in Valhalla. Nearly 222,000 square feet of lab space will be built along with retail and hotel space. The development will be built in three phases by Fareri, the developer who created the Maria Fareri Children's Hospital and Fareri Associates.
- Upon a change in ownership, over 90,000 square feet is currently being marketed for lease in Ardsley Park at 430 and 440 Saw Mill River Road.

Want to know more?

Lisa Strope
Director, Life Sciences and Healthcare Research
Americas Research
+1 (617) 316-6407
Lisa.Strope@am.jll.com

David Coffman
Analyst, Research
Americas Research
+1 (617) 531-4243
David.Coffman@am.jll.com

Need Life Sciences industry expertise?

Roger Humphrey
Executive Managing Director
Life Sciences
+1 908 698 1379
Roger.Humphrey@am.jll.com

Richard McBlaine
International Director
Corporate Client Development
+1 312 228 2793
Richard.Mcblaine@am.jll.com

John K. Cunningham
Executive Vice President
Life Sciences Advisory Co-Chair
+1 973 829 4677
Johnk.Cunningham@am.jll.com

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