

LIFE SCIENCES

Expanding life sciences industry creates opportunity for real estate investors

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by

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Executive summary

The life sciences property sector has flourished during the past few years. That trend is expected to continue in the near term and well into the future. The sector's positive property fundamentals have been fueled by record-setting life sciences industry capital infusions, creating growth and additional demand for office, R&D, lab space and other related facilities. Investors are increasingly recognizing the benefits — strong property-level fundamentals, portfolio diversification, value-add opportunities — of investing in life sciences properties in well-established and emerging clusters across the United States.

Despite the current social and economic challenges presented by the COVID-19 pandemic, the life sciences industry and property markets have shown relative strength. The sector performed well a decade ago in the midst of the global financial crisis, and while it may not be “recession-proof,” it could be labeled “recession resilient.”

Growth in the life sciences sector represents a secular trend that will offer opportunities for astute real estate investors that understand the sector, the special property requirements and the key markets.

INSIGHTS

- Demand from aging baby boomers for improved healthcare, extended quality of life and increased longevity, has fueled extraordinary growth in the life sciences industry.
- Since 2000, employment in life sciences has increased 87.9 percent compared with 14.4 percent for the United States as a whole, translating into significant demand for R&D and lab space and other types of related facilities.
- While dominant life sciences clusters such as the San Francisco Bay Area and Boston have established unique ecosystems, other growth markets and emerging markets are attracting tenants and investors.
- Over the past decade, the trend line for life sciences properties has been salubrious for investors, with vacancy rates tightening and rental rates ascending.
- Life sciences firms are deemed “essential”; many of these firms are at the forefront of the battle to tame COVID-19, and the property sector has performed relatively well during the pandemic compared with other property types.
- Investors and developers will need to be forward-looking to provide state-of-the-art, flexible-use space that not only fosters collaboration and innovation but can accommodate tenants' evolving requirements.

Introduction

What are “life sciences” exactly? It is an industry dedicated to protection, recovery and increasing longevity for living things, including humans and animals. Life sciences covers a wide range of medical fields, such as biotechnology, pharmaceuticals, biomedical technologies, life systems technologies, nutraceuticals, environmental and biomedical devices.

Currently, there are 52.4 million people aged 65 or older in the United States. By 2030 the number of people 65 and over is projected to exceed 73 million. As the population ages, the potential market for new treatments, drugs and equipment will grow. Backed by this societal demand for improved healthcare, extended quality of life and increased longevity, the life sciences sector has grown by leaps and bounds.

The focus on healthcare and the demand for new technology and medicines has boosted life sciences funding from three primary sources: government grants, funding from large pharmaceutical companies and investment from venture capital firms. This capital infusion has spurred employment, R&D activity and production, resulting in a steady and growing appetite for real estate.

The industry will see significant future growth potential:

- Global healthcare expenditures are expected to rise from \$7.7 trillion in 2017 to \$10.1 trillion by 2022, or at an annual rate of 5.4 percent.
- Worldwide prescription drug sales will have a positive compound annual growth rate (CAGR) of 6.9 percent

from 2019 to 2024, oncology will have an 11.4 percent CAGR, and orphan drug sales will post a 12.3 percent CAGR, according to a report by Deloitte.

- The value of global medical devices is expected to climb from \$425.5 billion in 2018 to \$612.7 billion by 2025.
- Venture capital funding for national life sciences companies was less than \$10 billion a year in 2012. In 2018, that number jumped to almost \$25 billion, a record, and in 2019, venture capital totaled about \$20 billion.

Since 2000, employment in life sciences has increased 87.9 percent, compared with 14.4 percent for the United States as a whole. The sector’s surge in employment has translated into greater demand for R&D and lab space, as well as and other types of related facilities. San Francisco and Boston have become the country’s two dominant life sciences clusters, but other leading life sciences hubs such as San Diego, New Jersey and Raleigh-Durham, are expanding; and emerging hubs, such as New York City, Seattle, Houston and Denver, are experiencing significant growth.

Prominent life sciences real estate owners/investors in the United States include public REITs and institutional investors, such as Alexandria Real Estate Equities, BioMed Realty and Morgan Stanley. The opportunity has more recently attracted a number of other seasoned investors, including Thor Equities and Tishman Speyer.

TOP 10 LIFE SCIENCES OWNERS						
Company	Location	Investor type	Estimated portfolio value (\$m)	Square feet	Number of properties	Featured markets exposure—count
Alexandria Real Estate Equities	Pasadena, CA	Public REIT	\$10,000+	35,400,000	288	9
BioMed Realty	New York City	Institutional	\$7,700	13,700,000	82	9
Healthpeak Properties	Irvine, CA	Public REIT	\$7,500	9,000,000	62	9
Karlin Real Estate	Los Angeles	Private/developer	\$300	6,400,000	4	1
Ventas	Chicago	Public REIT	\$1,900	5,000,000	22	4
Pfizer	New York City	Owner-user	\$900	3,700,000	7	4
PCCP (Pacific Coast)	Los Angeles	Institutional	\$700	3,400,000	8	3
Morgan Stanley	New York City	Institutional	\$1,800	3,400,000	13	3
Longfellow RE Partners	Boston	Private/Developer	\$1,400	3,000,000	25	3
DivcoWest	San Francisco	Institutional	\$2,100	2,900,000	11	2

Sources: NKF Research, Real Capital Analytics, PWC, NIH

Growth of an industry

Total life sciences research funding (venture capital investment plus National Institute of Health awards) was only \$12.0 billion in 1985. By 2013 it rose to \$37.0 billion and then to \$53.4 billion in 2017. Deloitte reports the life sciences industry made up 14.6 percent of the overall share of venture funding in 2018. These two sources only represent part of the industry's equation; the most significant funding contributors are the research and development units of large private companies, such as pharmaceutical firms.

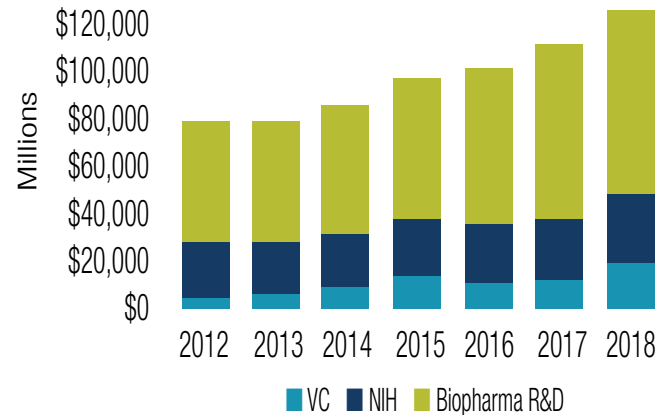
In the past decade, JLL reported more than \$213.0 billion had been invested in life sciences R&D.

The long-term fundamentals of the industry are solid:

- Investment in new labs and facilities will increase as funding and investment is directed to drug development companies.
- With constrained travel and the need for raw materials, U.S. manufacturing and production of raw materials will increase.

- The accelerating onshoring trend for pharmaceutical and biotech companies seeking to address supply-chain disruptions will increase jobs and production.

Total life sciences research capital by source



Source: Cushman & Wakefield Research

The geography of life sciences

Historically, life sciences development clustered in specific geographic nodes, as these firms often benefit from industrywide synergies. Markets such as the San Francisco Bay Area, Boston-Cambridge and San Diego proved attractive, with their respective combinations of educational/research institutions, health-services institutions, access to a high-tech workforce and industry funding, and sufficient R&D/lab space.

Between 2010 and 2018, these three prominent locations reaped the largest venture capital funding for life sciences companies: \$15.5 billion for Boston, \$15.0 billion for San Francisco and Silicon Valley, and \$5.6 billion for San Diego, reported Cushman & Wakefield. In 2018, 10 of the top 16 life sciences clusters in the United States received almost \$18 billion in venture capital investment; however, 80 percent of those dollars went to the big three locations.

TOP-10 LEADING LIFE SCIENCES MARKETS	
1. Boston-Cambridge	6. Washington, D.C.-Baltimore
2. San Francisco Bay Area	7. New York City (and surrounding areas)
3. San Diego	8. Philadelphia
4. New Jersey	9. Los Angeles
5. Raleigh-Durham	10. Chicago

Source: CBRE Research

TOP-RANKED EMERGING LIFE SCIENCES CLUSTERS	
1. Seattle	6. St. Louis
2. Houston	7. Dallas/Fort Worth
3. Austin	8. Atlanta
4. Minneapolis	9. Pittsburgh
5. Denver	

Source: CBRE Research

While the largest life sciences clusters have established unique ecosystems, this is not to say other life sciences clusters have not developed. Due to the expansion of the industry and expertise scattered throughout the country, life sciences centers have emerged in New York City, Maryland/D.C., New Jersey, Denver, North Carolina's Research Triangle, Chicago, Los Angeles, Philadelphia, Seattle, Minneapolis, Houston and Austin, as well as other locales.

The top 10 owners of life sciences properties own 36.3 percent of the Boston inventory, 34.4 percent of the San Francisco, and 13.3 percent of San Diego inventory. In addition, ownership concentrations are now being aggrandized in places such as Raleigh-Durham (Research Triangle) and New York City.

However, this ownership picture is changing as more firms appear on the investment landscape and emerging life sciences markets continue to grow.

Real estate fundamentals

Over the past decade, the trend line for life sciences properties has been salubrious for investors, with vacancy rates tightening and rental rates ascending — despite massive increases in the development of new space.

In some of the primary life sciences clusters — Boston, San Francisco, San Diego, Chicago, Los Angeles, and Washington, D.C. — vacancies for life sciences properties are significantly below vacancy rates for traditional office space. On a national basis, the life sciences real estate vacancy rate in 2019 was 9.0 percent, approximately half the rate recorded for traditional offices. In several markets, such as New York City and North Carolina’s Research Triangle, which have seen significant new development activity, life sciences vacancies are exceeding that of traditional office space.

When vacancies tighten, that usually means a rent increase will follow, and that has been the case pre-COVID-19. In the decade following the financial crisis, rents rose by 70 percent or more in Boston and parts of the Bay Area. Other hubs such as Raleigh-Durham (+61.4 percent), D.C. metro (+46.9 percent) and San Diego (+33.7 percent), recorded significant increases as well.

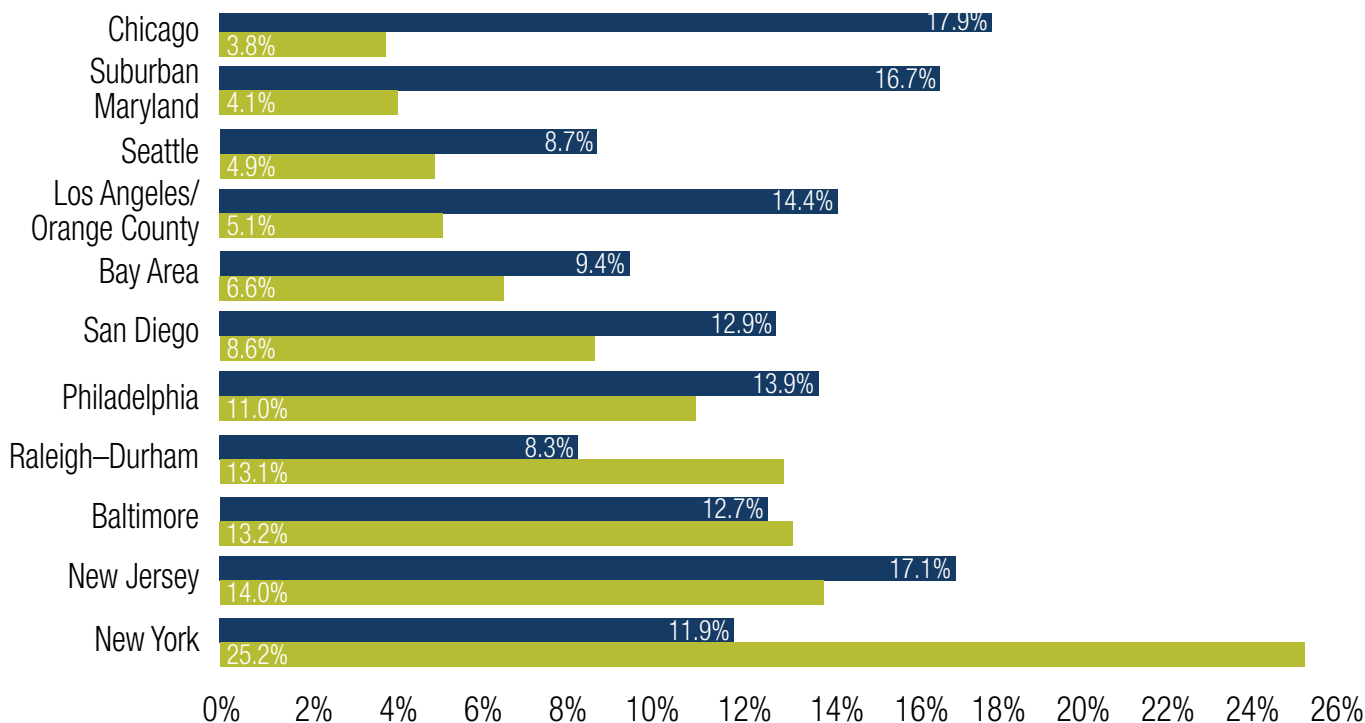
In 2019, average rents for life sciences space were highest in New York City (\$65 per square foot), Boston

(\$63), San Francisco (\$49) and San Diego (\$47), and lowest in Denver (\$17) and Los Angeles/Orange County (\$18).

In first quarter 2020, before the full impact of COVID-19, Cushman & Wakefield put together some interesting numbers on property values in hub markets. On a price-per-square-foot basis, life sciences real estate hovered around \$400 in the Washington, D.C., metro (suburban Maryland) and Seattle; approximately \$800 per square foot in New York City; slightly less than \$1,000 per square foot in the San Francisco Bay Area; and an off-the-chart \$1,800 per square foot in the Boston CBD/Cambridge market, where vacancy was less than 1 percent.

The COVID-19 pandemic, however, has introduced much uncertainty into the U.S. economy and property markets. Expectations are life sciences property fundamentals, especially in the hub markets, should outperform almost all other major property types. As Cushman & Wakefield notes, the life sciences sector’s advantage could be compounded because many hubs overlap with a concentration of tech and healthcare firms, two other industries important to solving the COVID-19 dilemma. Jobs in these industries and markets will fare better and help support demand for space, keeping vacancies and rents in check.

Office vs. life sciences overall vacancy rate, Q1 2020



Source: Cushman & Wakefield

Investing in life sciences properties

Demographic trends and other indicators point to sustained, strong growth for the life sciences industry, which will make life sciences properties an attractive proposition for investors and developers. The various disciplines within life sciences and the respective space needs of this diverse set of companies will demand industry knowledge, specialized real estate expertise and local market knowledge. Even with the proper skill set, however, investors and developers will need to be forward-looking to provide state-of-the-art, flexible-use space that not only fosters collaboration and innovation, but also can accommodate tenants' evolving requirements.

Some of the sector's property uses include.

- Hard-science technology space, an offshoot of industrial real estate, can be divided into three subcategories: materials science (biomaterials, battery and energy), devices (medical, consumer products, robotics, etc.) and life sciences. Medical device products have a shorter path to commercialization than quicker credit enhancements and earlier exits than the other categories.
- Hard-science buildings have different bones than other buildings; it is difficult to transform a generic building

into hard-science technology space. Differences include much stronger HVAC (10x the air changes, or more); higher slab-to-slab heights (13' to 17'); more robust floor load capacity (2x to 3x); more electric power (3x to 5x); more plumbing, electric and gas distribution; larger vertical penetrations for HVAC and MEP; and washable surface finishes.

- The phrase "research and development" represents two different positions on the tenant lifecycle continuum, and real estate needs differ. From a business standpoint, research operates with smaller batches, while development has bigger batches. Research means testing an idea; development refers to when a company has a product. The spectrum of needs ranges from startup companies that only require a super-functional, spartan place to work versus those that need impressive laboratories, offices, and boardrooms to host customer and shareholder meetings

Other key considerations for investors in the life sciences sector include:

Market selection — Startups are often spun out or funded by healthcare companies, academic institutions or government agencies, which is why many end up in

Largest Life Sciences Markets			
City	SF	Largest tenants	Submarkets
San Francisco	21,849,813	Genentech/Roche, AbbVie	Mission Bay, South San Francisco, Emeryville, San Carlos, Hayward/Newark/Fremont, Menlo Park/Palo Alto
Boston	21,778,822	Takeda Pharmaceutical Co., Sanofi	Greater Boston & suburbs, Cambridge, Seaport, Lexington/Waltham
San Diego	19,579,248	Illumina, Pfizer	Torrey Pines, UTC/Eastgate, Sorrento Mesa/Valley
New Jersey/New York	19,244,488	New York University, New York Genome Center, Bristol Myers Squibb Co., Celgene Corp., Merck & Co.	Long Island City, Midtown South, Princeton, Somerset/I-78, Route 18/8A Middlesex
Washington, D.C., metro (suburban Maryland/Baltimore)	17,176,361	AstraZeneca, GlaxoSmithKline, Gilead Sciences, Thermo-Fisher Scientific, Paragon Sciences, Emergent BioSolutions	I-270 Corridor, Urbana & Route 85, Riverside Research Park, Downtown Baltimore City
Seattle	11,250,326	Fred Hutchinson Cancer Research Center, Juno Therapeutics (Celgene), Seattle Genetics, Seattle Children's Hospital, Benaroya Research Institute	South Lake Union, Seattle Waterfront, Bothell (Eastside)
Raleigh-Durham	10,156,683	GlaxoSmithKline, Duke University	Research Triangle Park/RDU, Downtown Durham
Philadelphia	9,741,755	Merck & Co., GlaxoSmithKline	University City, King of Prussia
Los Angeles	8,500,000	Amgen, Medtronic, Grifols, Gilead Sciences	Thousand Oaks, San Gabriel Valley, LA Bioscience Corridor (downtown), Westside

Sources: Cushman & Wakefield Research, NKF Research

the same geographical hubs. These companies may want to be near, for example, NIH, Stanford University, Duke University or Johnson & Johnson. Similarly, emerging and established life sciences companies likely will prefer space in proximity to partners, suppliers and university research centers. These firms seek markets with a deep pool of life sciences talent and that offer property options with flexibility and function.

New construction or acquisition — Investors should analyze the local market to see what kind of tenants can be secured, if there is a progenitor nearby, if there are spaces in the market to support tenants in all phases of development and if there are buildings for all the different research tracks (molecular-bio, chemistry, biofoods, biomaterials, devices or materials science). What are local market land and construction costs compared with existing property values?

Property management — All life sciences space should be triple-net leased. A tenant manages its own space and is responsible for the ongoing expenses of the property. Tenants typically keep properties to the highest standards because the industry is highly regulated.

Tenant improvements — Build-outs for life sciences companies can be complex and expensive. A property owner will work closely with the company's representatives to ensure the space is properly designed and in

compliance with all relevant laws. First-generation space is where the bulk of TI investment is incurred. To the positive, that infrastructure stays with the landlord, so TIs decrease over time. In addition, tenants tend to be "sticky;" they typically are long-term occupants due to the specialization and sophistication of their spaces.

It is also important to dispel some of the myths that have developed regarding investing in life sciences real estate:

- It is not necessary to be in walking distance to other companies in Boston or San Francisco — the life sciences market is many places across the United States.
- Tenant build-outs are not incredibly expensive because landlords never pay the full amount; tenants typically oversee and pay for most of their own improvements.
- Once a tenant moves out, the prior build-out doesn't become obsolete as myriad companies in the same sector use the same research techniques.
- Second- and third-generation space does not decrease in value. In fact, roll-over space appreciates due to a "need-for-speed" in occupancy, ongoing tenant investment and high standards of care.
- The life sciences tenant pool is anything but shallow, as it encompasses many disciplines.

The COVID challenge

The life sciences property sector — like all property types — has been affected by COVID-19. According to a recent report by Newmark Knight Frank (NKF), laboratory productivity, tenant expansion plans, construction projects, the funding ecosystem and changes in regulatory processes were among top considerations for decision makers. However, life sciences firms are deemed "essential," as many of these firms are at the forefront of the battle to tame COVID-19, and the property sector has performed relatively well. In fact, in most the life sciences clusters, property fundamentals remain very positive, with very tight vacancy rates and peak-level rents.

While other property types — office, retail, lodging — have been hit hard by the pandemic, property fundamentals in the life sciences sector have remained solid. Historically, life sciences R&D employment during the recession has been stable, making the sector somewhat recession resilient, which in the past was likely due to the fact the industry is strongly driven by society's rising demand for healthcare-related product development and technological innovations.

Three things to be aware of in the short-term: (a) the life sciences sector is critical to COVID-19 efforts as the search for a vaccine continues; (b) lab space cannot be replicated in a home-office environment ,and workers have been deemed essential; (c) during a public health emergency, the Food and Drug Administration can use its Emergency Use Authorization (EUA) to allow use of unapproved medical products when certain criteria are met. This can fast-track production. Regarding COVID, for example, EUAs have been granted for in vitro diagnostic products; molecular-based, lab-developed tests; antibody tests; protective equipment; ventilators; and other medical devices and drug products.

In addition to the previously mentioned growth drivers, COVID-19 has also placed renewed emphasis on the need for domestic supply chains, from manufacturing of personal protective equipment and testing kits, to drug development and stockpiles, which could lead to an expansion of the domestic footprint of life sciences real estate, noted a recent report by NKF Research.

Outlook

Demand for highly sophisticated lab space and cutting-edge pharmaceutical production facilities has skyrocketed with expansion of the industry. In the near term, biotechnology will lead the way in protecting and treating individuals during the pandemic and, eventually, controlling COVID-19. In the longer term, structural changes in the life sciences industry, including escalating demand for new medicines, treatments and technology, will produce explosive growth, creating additional demand for space.

While the pandemic and economic uncertainty have created some investor paralysis, the life sciences growth story's underpinnings and the inherent "recession

resiliency" of the sector should incentivize investors to consider current opportunities. Several life sciences-focused public REITs and specialty private equity real estate funds are active in the market. Opportunities exist for investors and developers to build out/upgrade existing properties, convert other property types (e.g., traditional office, retail space), or initiate new ground-up developments.

A considerable amount of capital is being funneled into the life sciences industry. Out of pandemics and recessions come new technological breakthroughs. Expect to see a vast technological revolution that will expand the U.S. economy — and fuel the continued growth of life sciences — in terms we can't even currently imagine.