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THE CONVERGENCE UNDERPINNING LIFE SCIENCES REAL ESTATE

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Institutional real estate investors face a challenging investment landscape. Two decades of steady capital flows into the asset class from rising real estate allocations were already creating capital market pressures before the COVID-19 pandemic. Now, after a year in which people worked from home and shopped online, heightened uncertainty about future demand for office and retail real estate—the two largest property sectors of the investable universe—has further concentrated capital in an even narrower segment of the market: industrial and multifamily. These challenges and the resulting concentration into only two "regular" sectors have boosted the already-strong interest in alternative sectors.

Life sciences real estate, the specialized facilities that are a critical part of the rapidly expanding life sciences ecosystem, has seen a surge in investment interest since the pandemic. The sector was expanding and gaining investor attention well before the pandemic, but that momentum intensified as COVID-19 emptied malls, hotels, and most offices. The wave of equity and debt capital targeting the sector has compressed expected returns and raised the stakes. At the same time, powerful structural drivers and the ongoing "convergence revolution" make a compelling case for robust growth in life sciences to continue long after COVID-19 has been contained.

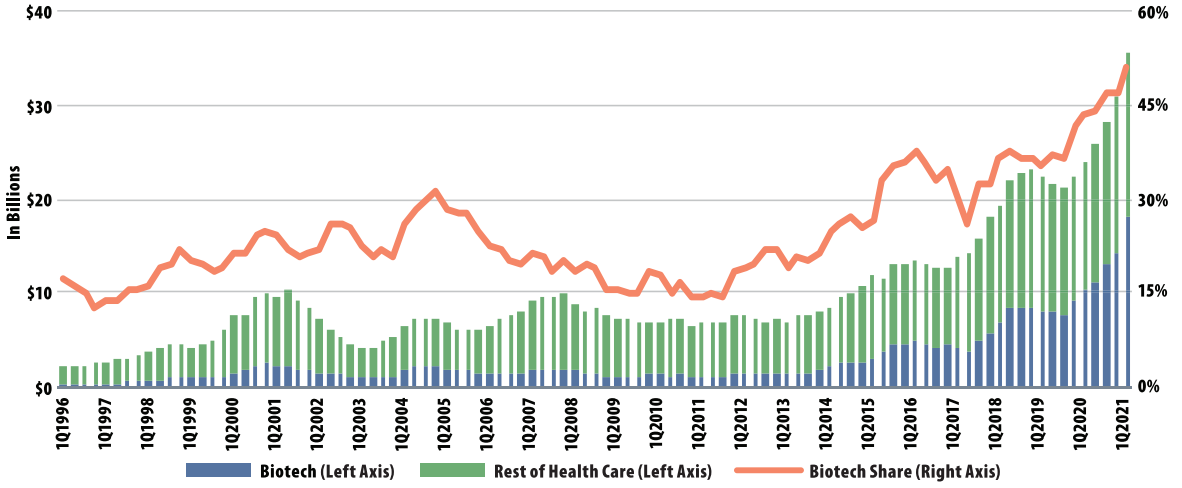
The Convergence Revolution

The explosive growth in life sciences occurring today is the product of what MIT researchers describe as the convergence revolution, or "the integration of engineering, physical sciences, computation, and life sciences—with profound benefits for medicine and health, energy, and environment."[1] The convergence revolution follows and builds on the two previous revolutions in life sciences research: the molecular and cellular biology revolution set into motion by the discovery of the DNA structure in the 1950s and, more recently, the genomic revolution that began with the mapping of the human genome in the early 2000s.[2] In the five years since MIT published "Convergence: The Future of Health," that convergence has attracted significant public and private capital motivated by

1. Phillip Sharp, Tyler Jacks, and Susan Hockfield, "Convergence: The Future of Health," Massachusetts Institute of Technology, June 2016.
2. Convergence Revolution, "*Timeline*," MIT Washington Office.

Exhibit 1: Venture Capital Investment in US Health Care Trailing Four-Quarter Volume

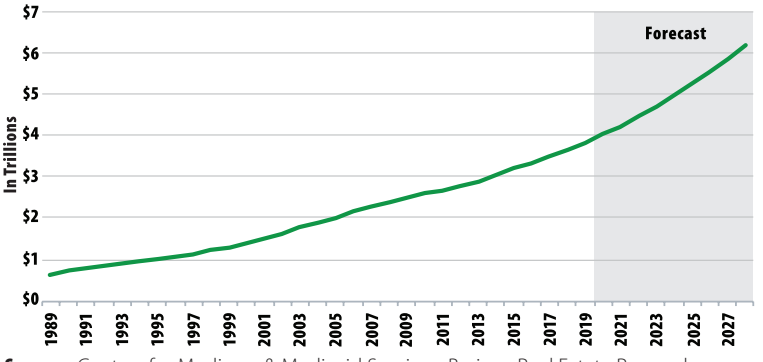
Private investment in health care has been rising since 2015.



Sources: PwC/CBInsights MoneyTree, Barings Real Estate Research

Exhibit 2: National Health Expenditures

Health care expenditures are on an unsustainable path.



Sources: Centers for Medicare & Medicaid Services, Barings Real Estate Research; as of Dec. 2019

social and financial reward that has provided the fuel for the sector's rapid growth. Venture capital investment in the health-care sector has increased sharply over the past five years, reaching an all-time high for five consecutive quarters (Exhibit 1).

Two durable and powerful structural drivers, population aging and technology, underpin the convergence and attendant growth of life sciences. Population aging is and will continue to create significant demand for better health care and medical solutions that enable people to live better while living longer. This is especially true of, though not limited to, baby boomers, the wealthiest generation in US history. About 10,000 boomers turn 65 each day, and in less than a decade, the full 70-plus million generational cohort will be age 65 or older.

Caring for baby boomer seniors together with demand from an aging global population and an expanding middle class will require innovation and further advances in a wide range of life sciences, from nanotechnology to synthetic biology, genetic sequencing, genetic editing, imaging, and smart devices. Growth and innovation will be important not only for the social benefits—improvements in health care, energy efficiency, and environmental stewardship—but also as a financial imperative. As shown in Exhibit 2, health-care spending in the US is poised to increase at a 5.4% annual rate between 2019 and 2028 to $6.2 trillion, an increase of $2.4 trillion and roughly 20% of forecast 2028 GDP, according to the Centers for Medicare & Medicaid Services. That spending will keep pressure on the industry to find more-effective and cost-efficient drugs and other

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therapies to alleviate the financial burden on the public and private sectors. It will also drive demand for a broad range of commercial real estate, from medical office to lab space.

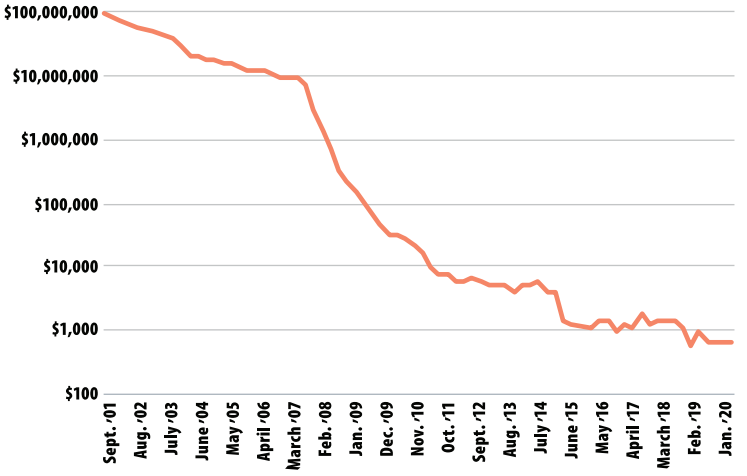
Technology has been a key catalyst for the growth of life sciences and for important breakthroughs over the past three decades. Modern, powerful computers have been instrumental in genome mapping and in the gene editing tools (CRISPR) used to develop the mRNA vaccines to contain COVID-19. The Exhibit 3 chart of DNA sequencing cost trends is illuminating. The sequencing cost per human genome has fallen precipitously since 2000, from $100 million at the beginning of the genomic revolution to less than $1,000 in 2020, according to the National Institutes of Health. The steep fall in the cost of genetic sequencing underscores the data explosion that is occurring. Vast sets of data are now widely available, and computing power continues to develop to process and analyze that data. As an example, between 2018 and 2025, the artificial intelligence market in drug discovery is projected to grow from $159.8 million to $2.9 billion, a nearly 53% annual growth rate.[3]

The Real Estate Opportunity

For real estate investors, the structural demand drivers and lack of existing inventory—despite the ongoing development boom—make a compelling case for investment in life sciences property. Biotech is just one subsector within the broader life sciences industry, but the growing demand from biotech companies is illustrative of the demand profile for the broader life sciences ecosystem. The biotech companies that are at the center of both the convergence revolution and the race against COVID-19—and that have captured much of the public and private funding in recent years—are a key demand driver for R&D and lab space today. Biotech employment began to accelerate in 2015–2016, or about the same time venture funding for biotech started to accelerate (Exhibit 4). Since 2016, biotech employment has grown at a 9% annual rate, far outpacing the broader labor market—even before the pandemic.

Exhibit 3: Cost per Genome

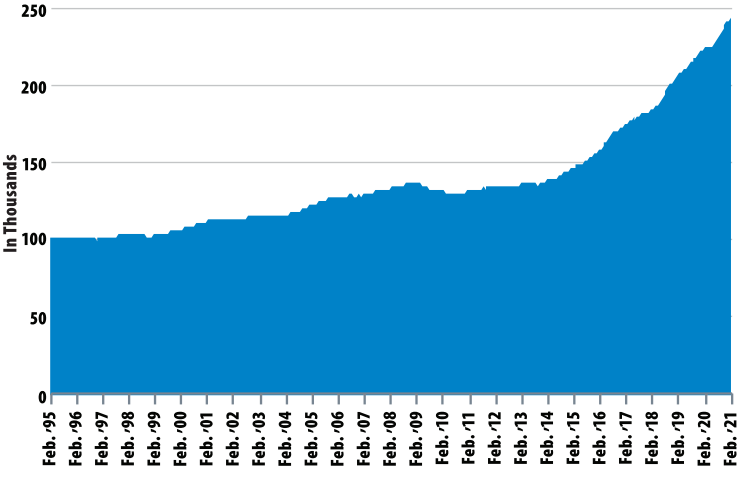
Technology has unleashed big data and AI.



Sources: National Institutes of Health, Barings Real Estate Research

Exhibit 4: Biotechnology R&D Employment

A growing employment base underpins demand.



Sources: US Bureau of Labor Statistics, Barings Real Estate Research

The rapid growth in the biotech companies responsible for the hiring boom has created tremendous demand for specialized real estate that in the top life sciences clusters is still quite scarce, even with the large and still-growing wave of supply. Market data for lab and other specialized life sciences space is limited and highly localized, which makes analyzing time

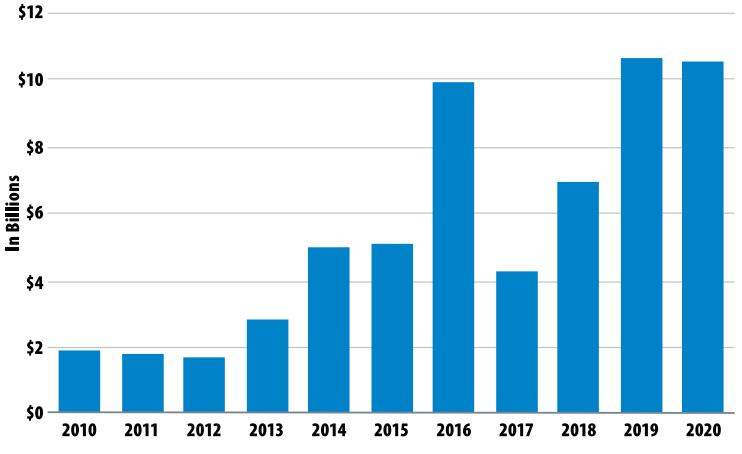
3. Greg Reh, "2020 Global Life Sciences Outlook," Deloitte Insights.

series data on an aggregate level more difficult (and less helpful). However, local market and submarket data for the major life sciences clusters illustrate the robust appetite for a broad range of space—R&D, labs, testing facilities, high-tech manufacturing, etc. The "big-three" life sciences markets—greater Boston, the San Francisco Bay Area, and San Diego—all have had several years of strong rent growth; and with a few exceptions at the submarket level, where supply can be "lumpy," all generally have low vacancy rates despite meaningful additions to stock.

Supply has ramped up in and around these nodes to relieve the space shortage, but new space often delivers pre-leased or leases up quickly. According to Newmark, the San Francisco Bay Area alone added a staggering 3.6 million square feet of new lab space in 2020, representing a 13.6% increase in inventory, yet the market recorded less than a 200-basis-point (bp) increase in vacancy. Moreover, unlike the broader office market, rental rate premiums continue to support development. For example, in Cambridge, the premier life sciences submarket of Boston, asking rents for lab space exceed $100 per square foot (triple net lease), or more than four times the average office asking rent for the Boston metro, according to CBRE. The rent premiums clearly reflect the higher costs associated with fitting out lab space, but given the more utilitarian nature of lab improvements, which typically include a standard package of basic features, turnover costs can be lower for lab users.

Exhibit 5: US Life Sciences Real Estate Transaction Volume

Ample liquidity exists for life sciences deals.



Sources: JLL Research, Real Capital Analytics, Barings Real Estate Research

The capital markets for life sciences real estate have been no less dynamic. Life sciences transaction activity has followed a trend similar to that of the leasing market, with volume topping $10 billion in both 2019 and 2020 (Exhibit 5).[4] Lockdowns during the second quarter last year disrupted activity in the second and third quarters, but by year-end, deal volume had rebounded to nearly the record level in 2019. Competition for stabilized assets in the major life sciences markets has pushed prices for newly built, best-quality assets well above $1,000 per square foot.

The starting point for investors considering life sciences real estate is a clear understanding of life sciences clusters. As shown in Exhibit 6, JLL Research identified key attributes that make a cluster successful. All the components are important, but proximity to major research universities and institutions, and the ideas and talent pool around those institutions, is what really distinguishes the top clusters. It also helps explain why the big-three markets together attract more than 60% of all venture capital investment in biotechnology, according to PwC MoneyTree. Estimates of lab space inventory vary somewhat by source, but the top three markets account for roughly half of all lab space in the US today. Per CBRE, Boston and San Francisco each have more than 30 million square feet (msf) of existing space and San Diego is considerably smaller (16+ msf). Market size drops significantly after the big three and then again beyond the top ten.

The opportunities for investors seeking life sciences exposure in their real estate portfolios span the full risk-return spectrum, from relatively low-risk, core stabilized assets to value-added conversion and repositioning plays and opportunistic, speculative development. Although most of the recent growth in the biotech sector has come from start-up companies

4. Per JLL, the spike in 2016 volume includes nearly $4 billion of life sciences assets that Blackstone acquired in the take-private transaction of public REIT Biomed Realty Trust.

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with limited credit, mature, well-established companies (e.g., Genentech, Pfizer, Merck) typically occupy large blocks of space in major clusters for access to research, ideas, and talent. For core property investors, these assets offer a bond-like, stable income return with very low default risk.

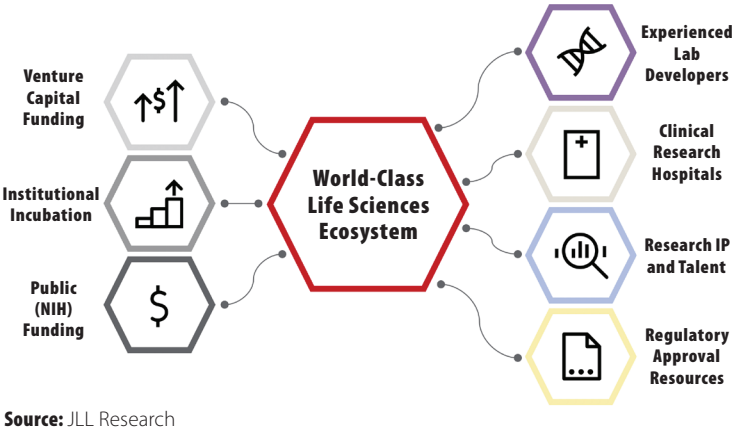
Investors can move up the risk curve by targeting "growthier" tenants, which often seek space in lower-cost submarkets where supply barriers also tend to be lower, and/or targeting opportunities outside the top life sciences clusters. Conversions also have gained attention in recent years as space becomes scarce in prime submarkets. Typically, conversions involve repurposing underutilized office or industrial assets in attractive infill locations and seek to benefit from speed to market to capture rising demand. With traditional office unsettled by the pandemic lockdown, more conversion projects will likely come forward. However, not all buildings are suitable for conversion. Physical aspects must meet stringent requirements (floor heights, floor load capacity, power and HVAC systems, etc.), and location strength is paramount.

Last, development is active across all the major life sciences clusters and in a growing number of smaller, emerging clusters in cities such as Austin, Atlanta, Denver, and Seattle. The demand story is overwhelmingly positive and, for now at least, appears to be keeping pace with supply, but it would be naive to assume there won't be some pullback in funding and demand once the threat from COVID-19 recedes. All else being equal, smaller markets that are more dependent on privately funded companies will be more vulnerable to supply overshooting demand for some period. However, the long-term growth trajectory of the life sciences industry—and the convergence revolution—will require substantially more space to meet the formidable demographic, health-care, and environmental challenges in the decades ahead.

Closing Thoughts

The global pandemic has thrust life sciences—and life sciences real estate—into the spotlight. Like so many things in the pandemic state, however, COVID-19 has done more to accelerate trends that were already under way than to create entirely new trends. The confluence of powerful structural drivers and scientific breakthroughs that have contributed to the life sciences ecosystem's growth over the past decade will have a flywheel effect that should generate even greater growth going forward. Real estate investors can participate in this dynamic growth and, over the long term, should also benefit from improvements in transparency and liquidity. The outlook, however, is not without significant risks, driven mostly by surging capital flows and supply, both of which must be evaluated carefully at the asset, submarket, and market levels. For now, life sciences real estate remains a niche sector that requires experience, a deep understanding of local market dynamics, and above all else, critical, relentlessly disciplined underwriting. ■

Exhibit 6: Key Components of a Successful Life Sciences Cluster



Source: JLL Research

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