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ISA2022 INSIGHT REPORT

Global Life Science Real Estate Opportunities

2022

Life sciences cluster near talent, funding, and universities

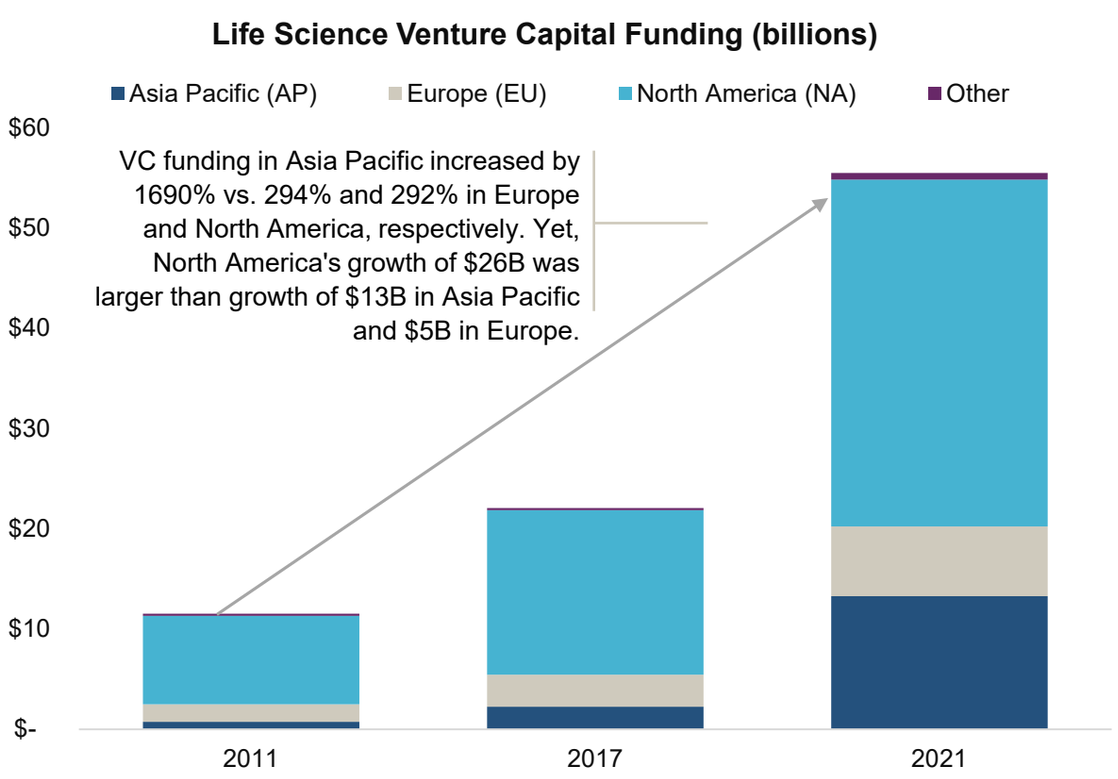
RAPID GROWTH DRIVEN BY SECULAR TRENDS

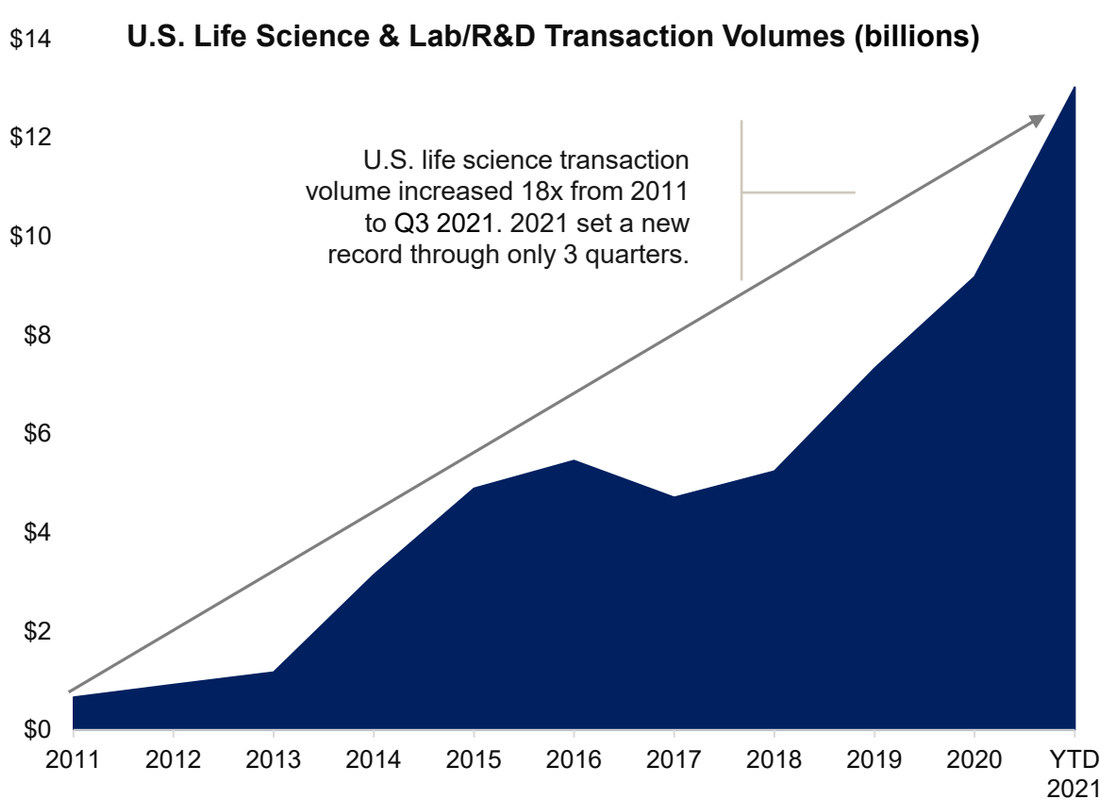
Strong Life Science Industry Demand Drivers: Rising healthcare spending, aging populations, advances in biotechnology, genomics, and medical devices support demand growth. Demand has escalated due to COVID-19 testing and vaccine development efforts around the world.

Clustered in Select Markets with Talent, Funding, and Educational Institutions: Activity is concentrated in a few leading clusters and some secondary clusters. In addition, there are an increasing number of emerging clusters working to attract companies. For example, venture capital funding has increased 1690% in Asia Pacific, driving emerging clusters in China, particularly Shanghai. Speed to market for new products is important, and proximity to incubators at significant research institutions facilitates development of new clusters.

Attractive Real Estate Fundamentals: Occupancy costs are a small part of overall costs and barriers to construction are present in most life science clusters. The strong demand and limited supply in recent years has created tight market conditions and enabled rising rents.

Increasing Investor Interest in Life Sciences Real Estate: Institutional investment in life sciences real estate is increasing, with several U.S. ODCE funds investing, some through joint ventures with established operators and private funds being raised to focus on the sector. Until recently, activity was centered in the U.S., but now deal flow is increasing globally. Top U.S. players include Alexandria Real Estate, BioMed Realty, Healthpeak Properties, Ventas, and Longfellow Real Estate Partners. BioMed Realty is the only one active outside the U.S., with investments in Cambridge, U.K., but others are making plans to expand internationally.





Sources: LaSalle Research & Strategy, JLL, CBRE, Cushman & Wakefield, and Thomson Reuters. Note. U.S. sales transactions include $5+ million, excluding land and development and entity-level data, .

Highly specialized sector with solid investment characteristics

Life Science Real Estate is Highly Specialized: These specialized properties support biotechnology tenants' research and production needs. This makes properly configured life sciences real estate different from other property types, including traditional office.

Investable Stock Growing: Until recently, most properties were owner-occupied, aligned with research institutions and universities, or owned by specialized landlords. This is rapidly changing in the U.S., but investable stock growth has been slower in other regions.

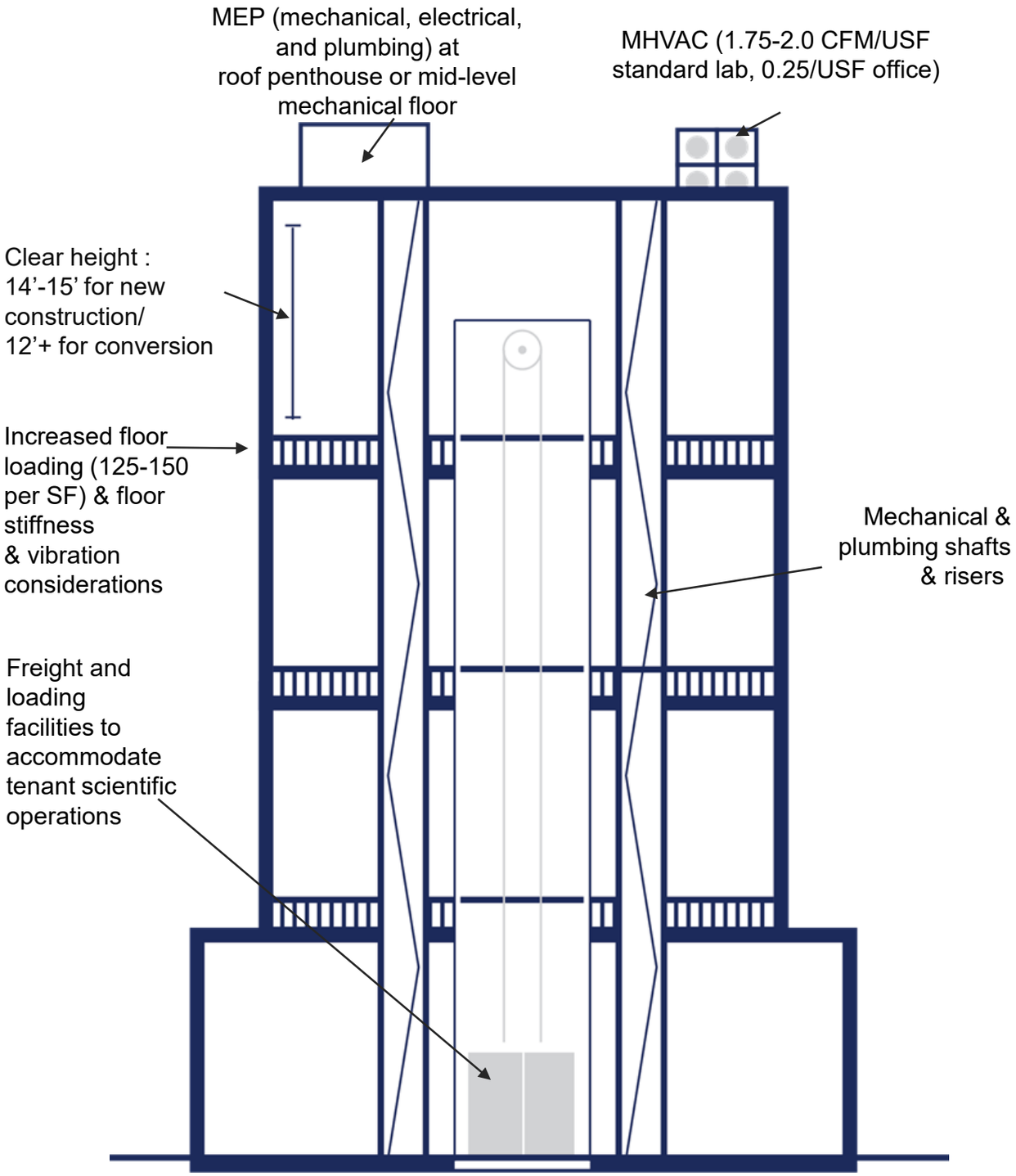
Solid Investment Characteristics: Compared to traditional offices, life sciences real estate cash flows are more stable and have a better demand outlook. In addition to higher long-term net operating income growth, the sector has lower on-going landlord capital expenditure needs, as most investment is reusable and there are high retention rates for tenants.

New Supply Risk: While the amount of new supply is elevated, demand for life sciences real estate in the U.S. is expected to outpace supply. Yet, there is a risk that the new supply may increase more than expected and lead to rising vacancy.

Opaque Market: Limited data and information in parts of the world creates both threats and opportunities for investors.

Limited Tenant Credit in Some Cases: A significant portion of demand is from venture-funded start-ups whose success is uncertain and lack credit.

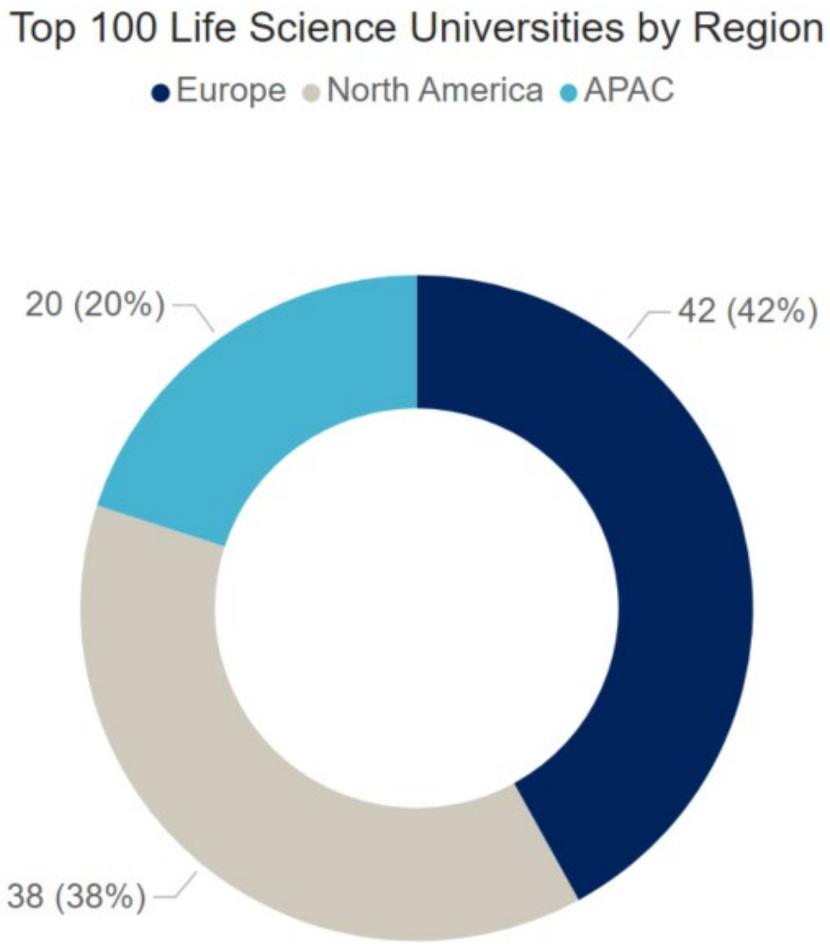
Life Science Lab Building Requirements



Program includes at least 50% Lab/Office;
Typical floor plate = 30,000 – 60,000 RSF; 350-500 RSF/per lab

Sources: LaSalle Research & Strategy, JLL, CBRE, Cushman & Wakefield, Thomson Reuters, and Alexandria Real Estate.

Research institutions drive demand for lab space around the world



Top 25 Life Science Universities

Rank	University	Life Science Cluster/Country, Region
1	Harvard University	Boston, U.S., North America
2	University of Cambridge	Golden Triangle, U.K., Europe
3	University of Oxford	Golden Triangle, U.K., Europe
4	Massachusetts Institute of Technology	Boston, U.S.
5	Stanford University	Bay Area, U.S.
6	Yale University	New York / Boston, U.S., North America
7	California Institute of Technology	Bay Area, U.S., North America
8	University of California, Berkeley	Bay Area, U.S., North America
9	Johns Hopkins University	Maryland/Washington DC, U.S., North America
10	Princeton University	New York/ New Jersey, U.S., North America
11	The University of Chicago	Chicago, U.S., North America
12	UCL	Golden Triangle, U.K., Europe
13	ETH Zurich	Switzerland, Europe
14	Tsinghua University	Beijing, China, APAC
15	University of California, San Diego	San Diego, U.S., North America
15	Cornell University	New York, U.S., North America
17	Imperial College London	Golden Triangle, U.K., Europe
18	Wageningen University & Research	Netherlands, Europe
19	University of California, Los Angeles	Los Angeles, U.S., North America
20	Columbia University	New York, U.S., North America
21	Peking University	Beijing, China, APAC
22	University of Pennsylvania	Philadelphia, U.S., North America
23	Duke University	Research Triangle, U.S., North America
24	Karolinska Institute	Sweden, Europe
25	National University of Singapore	Singapore, APAC

Life Sciences Real Estate Demand is Clustered in Locations with Concentration of Knowledge-based Industries: R&D activity benefits from the agglomeration of talent and institutions. This creates a strong pull for life sciences tenants and employees and fosters the durability of these clusters. The presence of leading life science universities is a good measure of the strength of these clusters.

Top Life Science Universities Present in Markets Around the World: European universities outnumber North American ones in the top 100, but the U.S. leads in top 10 universities and by volume of life sciences academic citations. U.S. institutions have generally been more successful in creating clusters of innovation than in other regions.

Source: LaSalle Research & Strategy, The World University Rankings.
Note: Rankings based on the universities that are leading across the following disciplines: agriculture and forestry, biological sciences, veterinary science, and sports science.

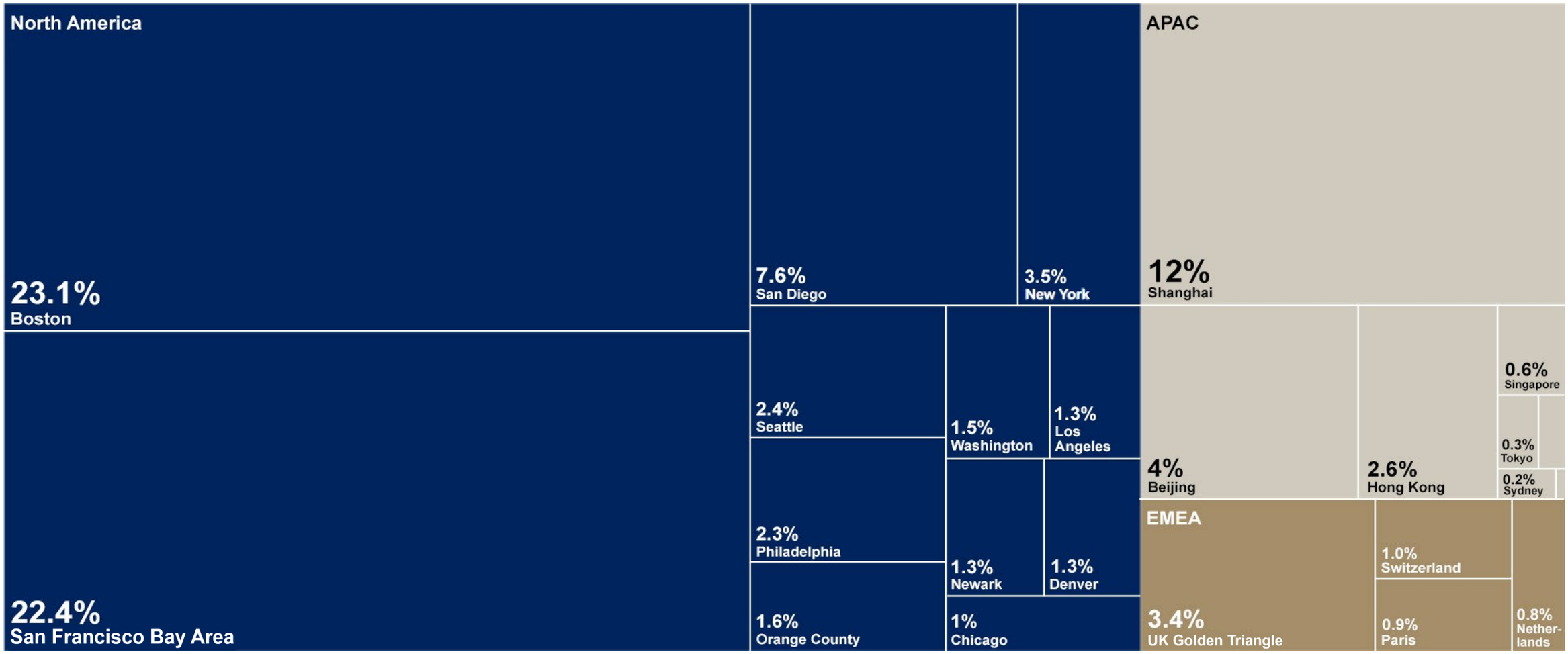
Life sciences VC funding drives growth and real estate activity

VENTURE CAPITAL DRIVES GROWTH OF COMPANIES, WHICH IS CRITICAL TO LIFE SCIENCES REAL ESTATE DEMAND

U.S. Remains Leader in Company Investment: In the last five years**,** 72% of life sciences venture capital funding was in the U.S. Life science companies aim to serve a global market with their products, but the innovation in the sector remains concentrated in the U.S.

Venture Capital Concentrated in Certain Markets: Of VC funding in the life sciences, 65% was in the top five markets: Boston (23%), Bay Area (22%), Shanghai (12%), San Diego (4%), and Beijing (4%).

Life Science Venture Capital Funding as % of Total Funding by Region & Market, 2017-2021

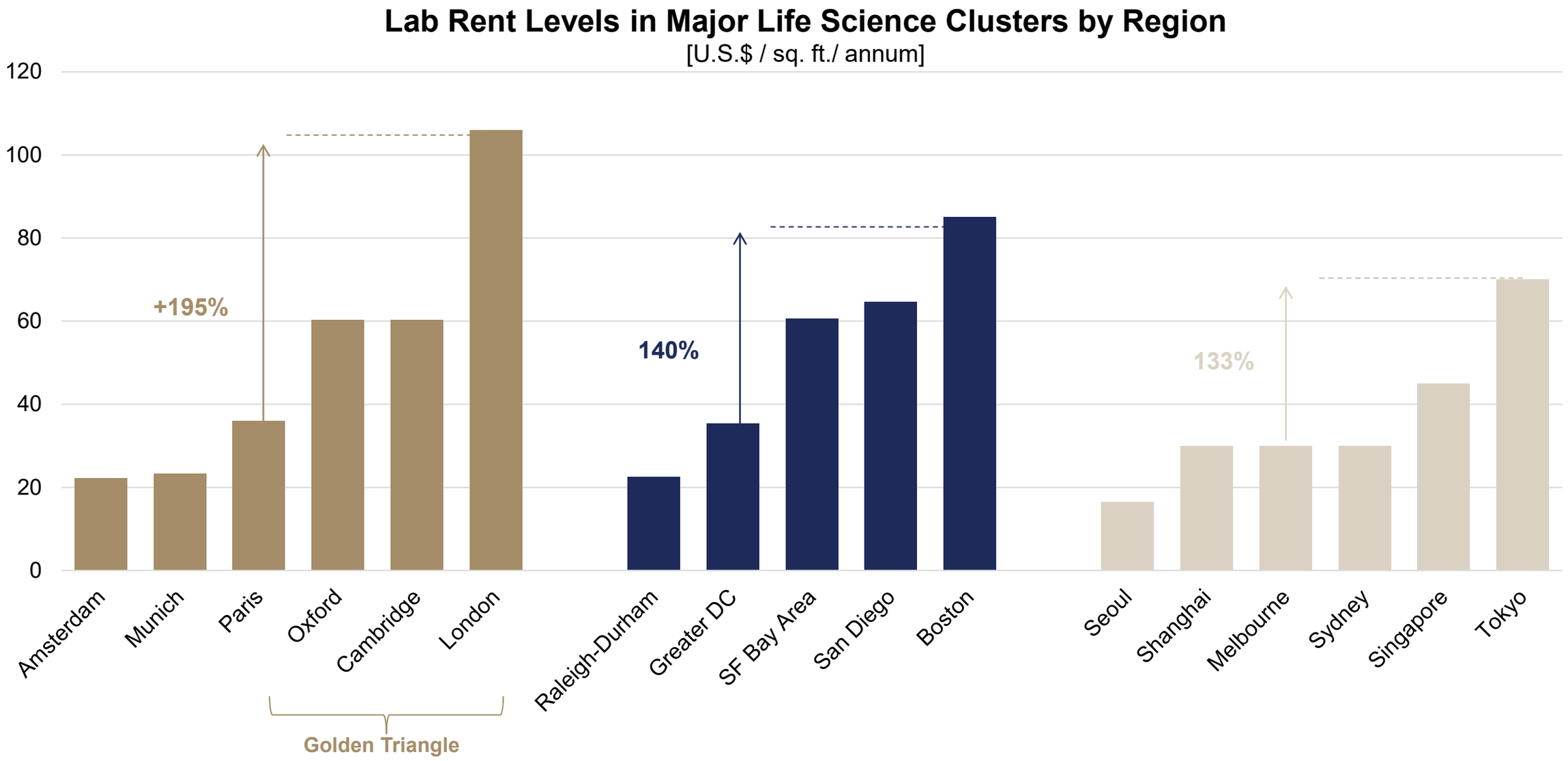


Venture Capital only Part of Life Sciences Funding, but Most Important to Real Estate Demand: Public funding to universities and research institutions and R&D investment by large pharma companies also significant, but recipients are more likely to own their real estate.

Patents Another Measure of Activity: Of all the life science patents given over the last five years, 93% were in the U.S.; Boston alone had 19%. With only 2% of all patents, Tokyo is the only non-U.S. market in the top 15, driven by pharmaceutical company patents.

Sources: LaSalle Research & Strategy, Thomson Reuters, and OECD.

Lab space rent levels reflect high concentration in leading markets



Lab Rents Display Significant Variation: Lab rents can reach north of U.S.$100 per sq. ft. annually in London. While this may contrast with the impression that U.S. markets are significantly more established than elsewhere, it also reflects broader market dynamics, as well as competing property type rents. Another driver of rent differentials across countries is the level of fit-outs carried out by landlords.

Top Markets in Each Region Command Significant Premium to the Next Tier of Markets: The largest and deepest markets within each region command rents more than double the level of those outside the top three. Tokyo is an exception, where the for-lease stock is very small.

Note: Lab buildings will have different location traits from one market to another, and rental differentials across countries will reflect both locational, cyclical, and structural differences. Asia Pacific rents reflected above are asking rent levels and include taxes, insurance, and maintenance costs. By contrast, U.S. and European rents are net of these.

Sources: Savills (2021) for Europe, JLL (2021) for North America, and CBRE (2021) for Asia Pacific.

Life science clusters are at different stages

STAGES OF MARKET EVOLUTION CREATE DIFFERENT REAL ESTATE INVESTMENT OPPORTUNITIES

Scale of Market – Life Science Inventory, Labor Pool, Funding, Universities, Employment

Other Asia Pacific Life Science Clusters	Sydney & Melbourne Life Science Clusters	Continental Europe~~an~~ Life Science Clusters	Singapore/ Shanghai Life Science Clusters	Emerging U.S. Clusters	U.K. Golden Triangle Life Science Cluster	U.S. Leading Life Sciences Clusters

North America Clusters Most Advanced and Opportunities Recommended Across the Risk Spectrum: Leading markets have existing real estate inventory, a top talent pool, deep funding, and full asset pricing. This includes Boston/Cambridge, the Bay Area, and San Diego, where vacancies are in the low single digits, rents are high, and demand is outpacing supply. Emerging life science markets include New York City, Seattle, Research Triangle, Philadelphia, Los Angles, and Toronto, where access to talent and funding is available and rents are more affordable. Strategies across the risk/return spectrum are recommended, but tenant and asset underwriting is critical.

Opportunities in Newer Clusters Exist in a Few Select Markets Globally: Investor interest is growing beyond the leading U.S. clusters, although the evolution of the sector in Europe and Asia Pacific is in its infancy by comparison. The leading ex-U.S. market is the Golden Triangle in the U.K., encompassing Cambridge, Oxford, and London. Singapore and Shanghai are further along their evolution than Continental Europe life science clusters in the Netherlands, Germany, and France, among others. Sydney and Melbourne are next, followed by other Asia Pacific clusters.

Idiosyncratic Local Factors are Challenges to Institutional Investment in Some Markets: The degree to which R&D is undertaken by (public) universities varies from country to country. Many underlying conditions to support a vibrant life science real estate market are in place, but pharmaceutical companies are generally cash-rich and do R&D in-house and tend to be owner-occupiers of their space.

Opacity in Newer Markets Also Creates Opportunities: In line with their smaller scale, non-U.S. markets tend to be considerably less transparent. However, strong rates of growth in funding and research output highlight that investors can also capture growth in the sector outside the U.S.

INVESTMENT RECCOMENDATIONS

- **The U.S. is a leader in the life sciences with several deep markets suitable for either core investing or development.**
- **Strategies for investments in the U.K.'s Golden Triangle include core, refurb/build-to-core, and build-to-suit.**
- **Core investments in strong Continental Europe life science clusters.**
- **Asia Pacific has several rapidly-growing clusters for core-to-core-plus investments including build-to-suit for pre-let space.**

Sources: LaSalle Research & Strategy, JLL, CBRE, Cushman & Wakefield, and Thompson Reuters.

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