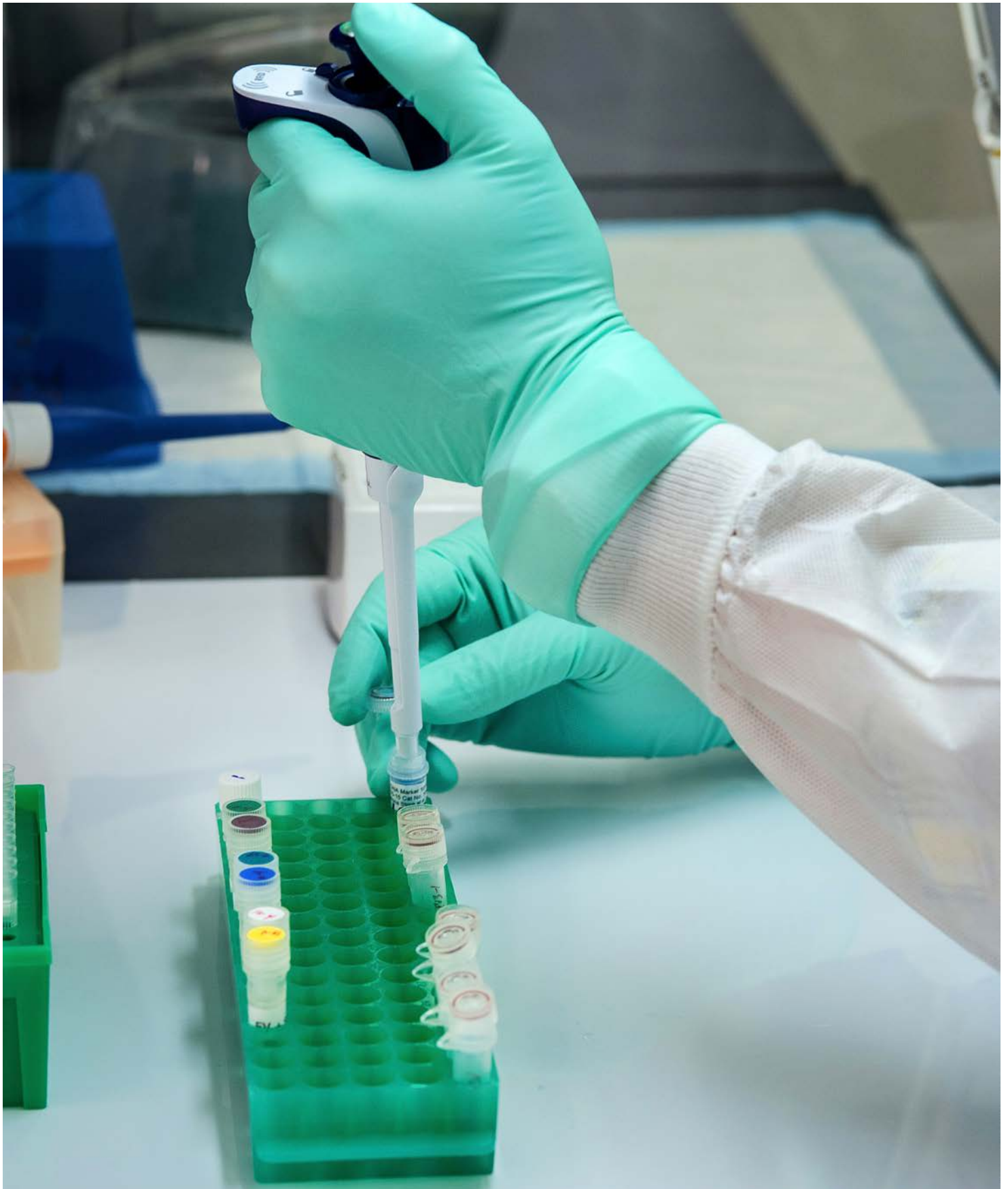


Life Sciences: Trends & Outlook





Global & UK trends

Despite lower levels of capital raising, the real estate fundamentals remain strong

The past 12 months has not slowed in terms of interest levels from developers, investors, and landlords regarding the science sector. Colleagues across the Savills global network have been discussing the growth potential and becoming involved with new projects. It is not a sector that goes away as the global impact of Covid-19 recedes. The structural shifts required in ensuring human health issues and needs are front and centre will ensure a continuation in the need to deliver scientific discovery, which will require real estate.

Funding of discovery comes in various forms - corporate, government and investors. Tracking this provides an indicator of future growth. Looking at the scale of capital raised in the life science sector, including corporate M&A or venture capital (VC), fell in 2022 (see chart below). However, this was following an abnormally high 2021. At the city level, as shown in the right-hand chart below, the US continues to dominate, including New York (see page 8) and Boston/Cambridge (see page 9). Where does the VC funding market go from here? Venture

capitalists are sat on record levels of "dry powder" following tens of billions being raised in the past couple of years. When they begin to invest, it will be chasing the higher quality opportunities and those opportunities within the life science sector will be considered equally. This will increase real estate demand.

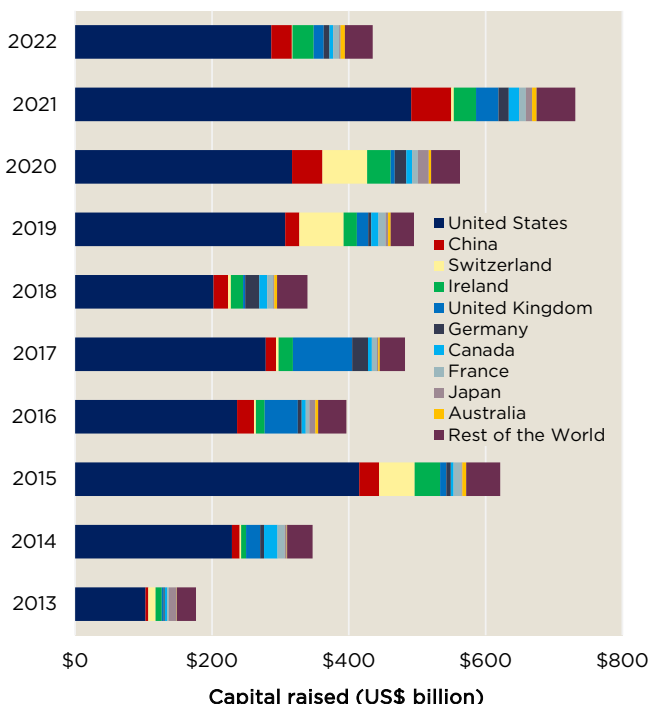
It is also worth reviewing what the large pharmaceutical companies are doing. Away from the much talked about level of VC activity, it is the pharma companies that are making the big corporate acquisitions. They are also growing their spend on R&D as part of their strategy alongside M&A activity. For the top ten pharma companies, based on latest data, annual R&D spend rose 13% on average and totalled around \$94 billion. At the same time, sales grew by 23% on average per annum. The large pharma companies will remain acquisitive, in terms of real estate, but will also be rationalising in some locations.

The ESG plans of the life science sector have grown considerably in the past few years and the article in this report (page 10) outlines the challenges and strategies. Some initiatives have

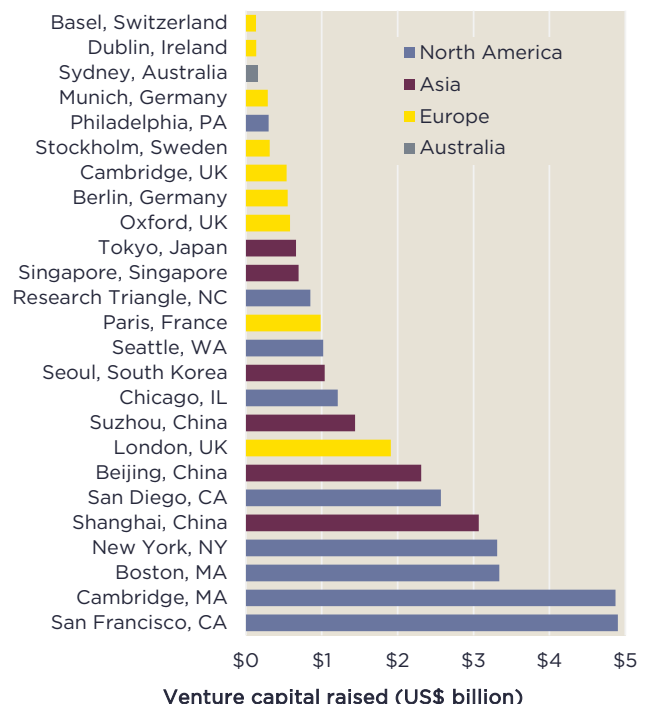
started at the grassroots level with laboratory users questioning their use of equipment and consumables (see mygreenlab.org). Certifications have also grown, as seen in the wider global commercial real estate market, but Laboratory Efficiency Assessment Framework (LEAF) is highlighted in the article.

During the first week of March, the UK Government published the Science & Technology Framework, which sets out the 10-point plan for science and technology growth in the UK. This is a great step forward and funding has been committed, but must grow further over time to ensure the UK remains world-class. Also, the Horizon Europe Guarantee scheme has been extended to end of June 2023, which protects funding for research. Hopefully, negotiations with the EU over research collaborations will take the next positive step forward in the coming months. This supports research output in various institutions and assists with the formation and growth of science companies, resulting in future take-up of real estate. Supporting the smaller business remains a critical discussion. The Spring

The US continues to dominate life science capital raised volumes This includes M&A, IPO, venture capital and private equity deals.



Top 25 cities The US and Chinese cities dominated the top-ranking locations, in terms of venture capital raised by life science companies last year.



Source Savills, PitchBook Data, Inc. (Data has not been reviewed by PitchBook analysts)

Source Savills, PitchBook

“ Given the level of unsatisfied demand, the delivery of new stock across the golden triangle will be critical. The emergence of new lab space will help to set more rental evidence, which should help to underwrite further development in 2023 ”

UK Budget in March announced a partial reversal of previous tax credit cuts, but also introduced favourable R&D expenditure credits. Both a step in the right direction.

The continued imbalance between supply and demand of laboratory space across the 'golden triangle' market area has resulted in the region having strong rental growth prospects. The vacancy rates for available fitted laboratory space are below 1% in both Cambridge and London and 7% in Oxford demonstrating the supply constraints present in the market. The shortage of immediately available fitted lab space has resulted in landlords across the region considering retrofitting existing office stock and delivering speculatively fitted lab space. Requirements seeking laboratory accommodation are often driven by organic growth from occupiers who are seeking space within a three to six-month timeframe which will benefit landlords who are able to speculatively fit accommodation with laboratory space in 2023. The rental premium for fitted lab space when compared to conventional office space is on average 70% higher across Cambridge, Oxford, and London.

There is a chronic shortage of fitted lab space in the city centre locations of Oxford and Cambridge which has resulted in strong rental growth prospects; rents are expected to reach near £100 per sq ft for fitted lab space in Cambridge by 2026, reflecting a 25% increase on the current market rent. Significant rental growth is also expected in Oxford. The London lab market is nascent, with rental premiums beginning to emerge in Q4 2022. Fitted lab transactions have already surpassed the £100 per sq ft level in King's Cross, where £110 per sq ft has been achieved and likely to go higher this year. Rental levels in the mid-£90s per sq ft are being achieved in White City and Hammersmith.

The real estate implications and opportunities are considerable in the science sector and, as we picked up in the previous version of this report, the manufacturing side is as important as the labs. Science is not just about labs. In the UK, albeit announced a year ago, the Life Science Innovative Manufacturing Fund will provide up to £260 million. Most of the funding (£200 million) will be used to invest in digital capabilities in clinical trial services and to help researchers better access NHS data as it is so important to commercialise discovery. A further £60 million will be available to support commercial-scale manufacturing investments by companies developing a range of technologies including medical devices and diagnostics, and cell and gene therapies. This will assist in strengthening the UK science ecosystem.



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View from the Head of UK Science at Savills

Take-up for science-related real estate across the 'golden triangle' of London, Oxford and Cambridge totalled 1.39 million sq ft in 2022, the highest figure in the past five years.

Both London and Oxford saw an increase in take-up at 451,148 and 497,911 sq ft, respectively. In contrast, our figures show that Cambridge saw a 35% decline in 2022 to 438,911 sq ft, which can be attributed to a critical lack of stock, with vacancy rates for labs at just 0.57% across the city.

Key deals included GlaxoSmithKline (GSK) taking 145,000 sq ft at the Earnshaw Building on New Oxford Street in London, which signifies the increasing interest from big pharma looking to take advantage of the capital's growing science ecosystem. VC-funded biotech firm OMass Therapeutics took 16,000 sq ft of fully fitted lab space in Building 4000 at ARC Oxford, and BlueGiant took 7,500 sq ft at Rolling Stock Yard in King's Cross, one of the first 'lab premium deals' in London.

Venture capital funding also remained positive in 2022, with London alone 67% above the five-year annual average. In total, the golden triangle saw £2.4 billion of VC raised, which we anticipate will translate into further real estate requirements as these businesses continue their expansion.

What is clear is that 2023 is likely to see the impact of a tougher funding market, with early-stage occupiers finding it harder to raise venture capital. Although London, in particular,

is more insulated than other global markets, occupiers will still look to conserve cash in the face of wider economic headwinds. With this in mind, it will be the landlords who provide both flexibility and the right type of space who stand to benefit the most.

Looking ahead, Savills has recorded over 4 million sq ft of requirements across London, Oxford and Cambridge, suggesting there is still a significant level of demand for laboratory space.

Given the level of unsatisfied demand, the delivery of new stock across the golden triangle will be critical. The emergence of new lab space will help to set more rental evidence, which should help to underwrite further development in 2023. There is no doubt the sector has taken a huge leap forward but still faces numerous challenges, including streamlining the planning system to unlock this delivery, as well as getting the right long-term strategic policies in place to better support science firms on the road to commercialisation.



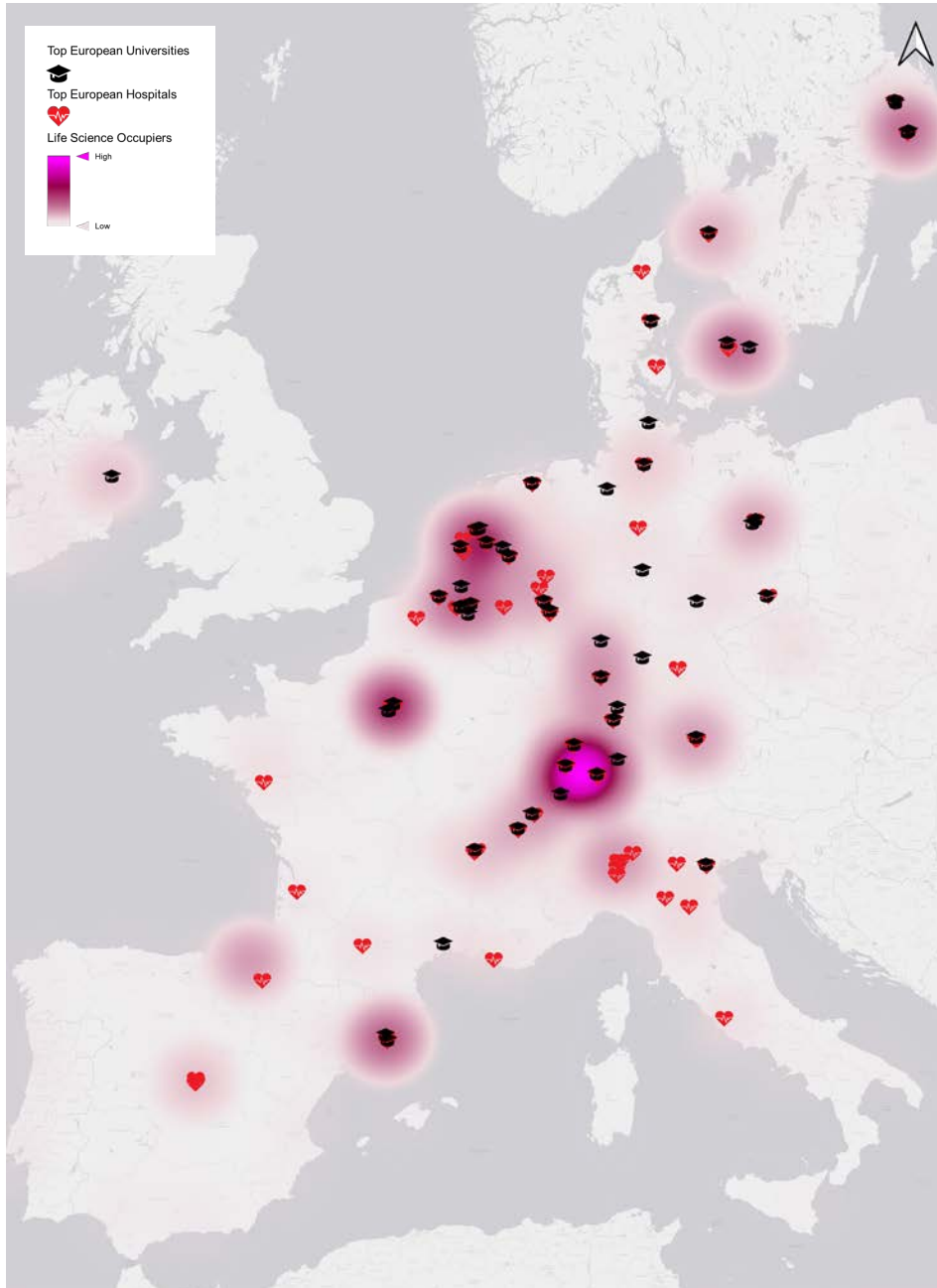
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“ Innovation is not constrained to particular locations, and centres of excellence are strengthening across Europe ”

Europe

Unlocking the potential

European life science activity hotspots



Source Savills

The map visualises life science occupiers, top universities and leading hospitals within selected European markets (Belgium, Denmark, Czech Republic, Denmark, Italy, Ireland, France, Germany, Netherlands, Poland, Portugal, Spain, Sweden, Switzerland). It includes hospitals ranked within the top 150 globally (Statista, 2022) and universities within the top 200 globally for life sciences (Times Higher Education World University Rankings 2023).

Unlocking the potential of the European life science sector has been the target of a span of credible investors over recent years. In order to do this, it is paramount to follow the science. Building a resilient investment strategy across Europe requires you to look beyond core markets to find opportunities.

The science sector is an interconnected ecosystem of public-private partnerships and collaborations, and a resilient location for science real estate provides the space to allow these activities to excel and interlink. Innovation is not constrained to particular locations, and centres of excellence are strengthening across Europe. This is presenting opportunities for real estate investors across the continent.

Looking outside the UK, we have observed heightened investor appetite for life science assets in core clusters across continental Europe, particularly within France, the Netherlands, Germany, Switzerland and increasingly the Nordics, Spain, Belgium, and Italy. Much like in the UK, where activities are centred around the 'golden triangle' of Cambridge, Oxford, and London, in Europe, we are seeing similar clustering patterns emerge, creating centres of excellence and internationally connected ecosystems.

Established internationally linked ecosystems

France is one of the key locations seeing a significant increase in the number of life science companies, as well as growth in venture capital funding. Home to three highly ranked hospitals and four world-renowned universities, Paris has become the most notable cluster within France. New entrants are rapidly accelerating the growth of the science market here, by developing purpose-built facilities designed to nurture the science ecosystem. Real estate investors have made their first entry into the sector in Paris in the past year, including Oxford Properties, which partnered with Novaxia to acquire Biocitech in north-east Paris, and Kadans, which are speculatively developing a life science building in Villejuif and Paris-Saclay. In parallel, we are seeing increased interest from investors looking at retrofitting business parks in key locations throughout France.

The Netherlands has also seen examples of life science real estate development in the past year, focused within the core regional cluster of Amsterdam, Rotterdam, and Leiden. With a concentration of leading hospitals and universities, the Netherlands benefits from being

“ Looking outside the UK, we have observed heightened investor appetite for life science assets in core clusters across continental Europe, particularly within France, the Netherlands, Germany, Switzerland and increasingly the Nordics, Spain, Belgium and Italy ”

home to many centres of excellence within the science sector. Leiden Bio Science Park, for example, has been the focus of many investors and occupiers and has seen positive rental growth this year. The real estate offer is also evolving; for instance CBRE IM has committed to forward fund Batavia Biosciences' new GMP facility. However, there is huge regional strength in the Netherlands too, with key science parks and academic anchors across the country. One such example is the Wageningen University & Research, which is ranked 5th in Europe, and 20th globally¹, for life science studies and is considered to be the world's most sustainable university.²

Germany leads as the top market for investment into R&D by pharma companies³ and is home to global leaders, including Bayer, Boehringer Ingelheim, and Merck KGaA. Within the country, science and innovation activities are geographically dispersed. With 19 universities ranked in the top 200 universities globally⁴ for providing life science education, and 14 world-leading hospitals⁴, Germany benefits from a pool of top talent and clinicians which has allowed centres of excellence to form across the country. Indeed, the Global Innovation Index recognises that Europe's largest economy has ten globally renowned science and technology clusters.⁵

Activity in Germany is closely linked into neighbouring markets, through internationally connected ecosystems. The Rhine-Ruhr region of Germany and northern France link into the international cluster, BioValley, which joins those markets with Switzerland through the Basel region. Basel continues to be a leading cluster within Switzerland, whilst Zurich is home to many life science companies headquarter functions. Switzerland ranked first globally in the Global Innovation Index in 2022, excelling across providing infrastructure, human capital, knowledge and technology outputs, and the occupational market is typically being served by university-linked science parks. The success of their innovation market is underpinned by world-renowned education provided by the likes of ETH Zurich, which is ranked 3rd in Europe, and 13th globally,¹ for life science education.

In a similar fashion, key markets in the Nordics are connected through the Medicon Valley, which joins Copenhagen through to Stockholm. Much of the activity in Denmark

is based in Copenhagen and continues to be centred around the world-renowned Technical University of Denmark, whilst in Sweden, occupiers primarily look to Stockholm and southern Sweden. Again, Sweden also performs highly in the Global Innovation Index, ranking 3rd globally in 2022, underpinned by strengths in labour and knowledge sharing.

Emerging centres of excellence

Whilst Belgium remains a smaller market for science real estate, the ecosystem is strengthening, underpinned by the academic environment and ability to translate this into innovation activities. KU Leuven in Belgium is ranked 18th in Europe for life science education and has a large student population.¹ KU Leuven Research & Development (LRD), the technology transfer office of KU Leuven, was established in 1972 as one of the first of its kind in Europe, and it has a long-standing history of collaborating with industry, patenting, licensing and creating spin-off companies to drive innovation across Belgium and beyond. Belgium is seen to be punching far above its weight in terms of IP and patents, and the knowledge base is clear, and its strategic location in northern Europe could see the area become a key manufacturing and distribution location.

Similarly, Spain has the potential for significant growth in the science real estate market. Barcelona has a strong cluster of life science occupiers, underpinned by two world-leading hospitals and two top universities. Madrid is home to four world-leading hospitals, including La Paz University Hospital, which is renowned for being one of the largest hospitals in Spain, and for the Hospital La Paz Institute for Health Research (IdiPAZ), which fosters collaboration between researchers to promote translational biomedical research and innovation.³ The life science real estate market in Madrid is evolving, and the Madrid Science and Innovation District (MaSID) is ahead of the curve in providing functional real estate for science and technology companies to grow and scale.

In addition, the Italian life science market is growing, underpinned by strong development activity within Milan. Milan Innovation District (MIND), a 100-hectare mixed-use redevelopment, is currently being developed by Lendlease, with the aim of becoming a world-leading science, knowledge and technology hub.

MIND is already home to several key anchors, including the new headquarters of the IRCCS Galeazzi hospital; Human Technopole, Italy's new research institute for life sciences; and the Science Campus of the University of Milan. The strength of these anchors is driving tenant engagement with AstraZeneca, Illumina and Bio4Dreams taking space.

Finally, Ireland is an interesting growth market. Whilst activity has been geographically dispersed, there is naturally a concentration around Dublin, which is home to the world-renowned university, Trinity College, ranking 41st in Europe for life science education. Ireland has developed particular strengths within medical technology, driving demand for high-tech manufacturing space.

Sources:

- 1 Times Higher Education Guide 2023, published 2022
- 2 UI GreenMetric World University Ranking (out of 956 universities).
- 3 EFPIA, 2020
- 4 Statista, 2022
- 5 Global Innovation Index, 2022



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The emergence of a 'lab premium'

Investors and developers have been grappling with build cost inflation across all sectors recently, with the BCIS reporting a 7.6% increase in All-in Tender Price Index (TPI) from Q4 2021 and Q4 2022. The life science sector is not immune to this trend.

Life science real estate, specifically laboratory and specialist manufacturing space, is particularly complex to develop due to the technical specification required and build costs of these facilities are typically higher than for standard offices. Given the nascent occupier market in many emerging clusters, coupled with limited opportunity for pre-lets given development timeframes and a lack of transparent market evidence, investors have encountered challenges in underwriting investments.

Savills began to track laboratory rental evidence across the golden triangle over five years ago and we have seen a clear emergence of 'lab premiums' in these key markets. In parallel, our continental European Life Science Databook is also evidencing such a trend. We believe these rental premiums are being driven by two fundamental factors:

1. Build Costs: Simply put, life science facilities are more expensive to develop, therefore, the achieved rent must be higher than standard offices in order to provide a suitable yield on cost (YoC) for developers and investors to render a scheme viable. Similar dynamics are observed when comparing standard logistics facilities to cold storage or

specialist pharma manufacturing assets; and

2. Demand vs Supply Imbalance: In many of the key clusters across Europe there is a chronic undersupply of suitable real estate, leading to a demand and supply imbalance. Both large corporates and small scale-ups are increasingly looking to secure space in key clusters so they can continue to research and innovate. Delays in securing appropriate space are often a hindrance to the core business, and, as such, we have seen evidence of these businesses being less rent-sensitive when compared to other sectors.

The chart below demonstrates lab premiums throughout select European markets. Savills observes the largest lab premiums in secondary office markets such as Stevenage, where the 'Shell & Core Lab Premium' and 'Fully Fitted Lab Premium' is 63% and 138%, respectively. This differential is more significant than in core office markets such as Copenhagen, where the prevailing office rental tone is strong. Indeed, throughout the UK and continental Europe, Savills research demonstrates a higher rental premium in regional locations.

The average fully fitted lab premium across the UK and Europe is 76%, when compared to the prevailing office rental tone. Whilst this rental premium might seem attractive in today's market, investors and developers need to fully understand the CAPEX outlay in delivering this space and the

potential absorption risk given the bespoke requirements of target occupiers.

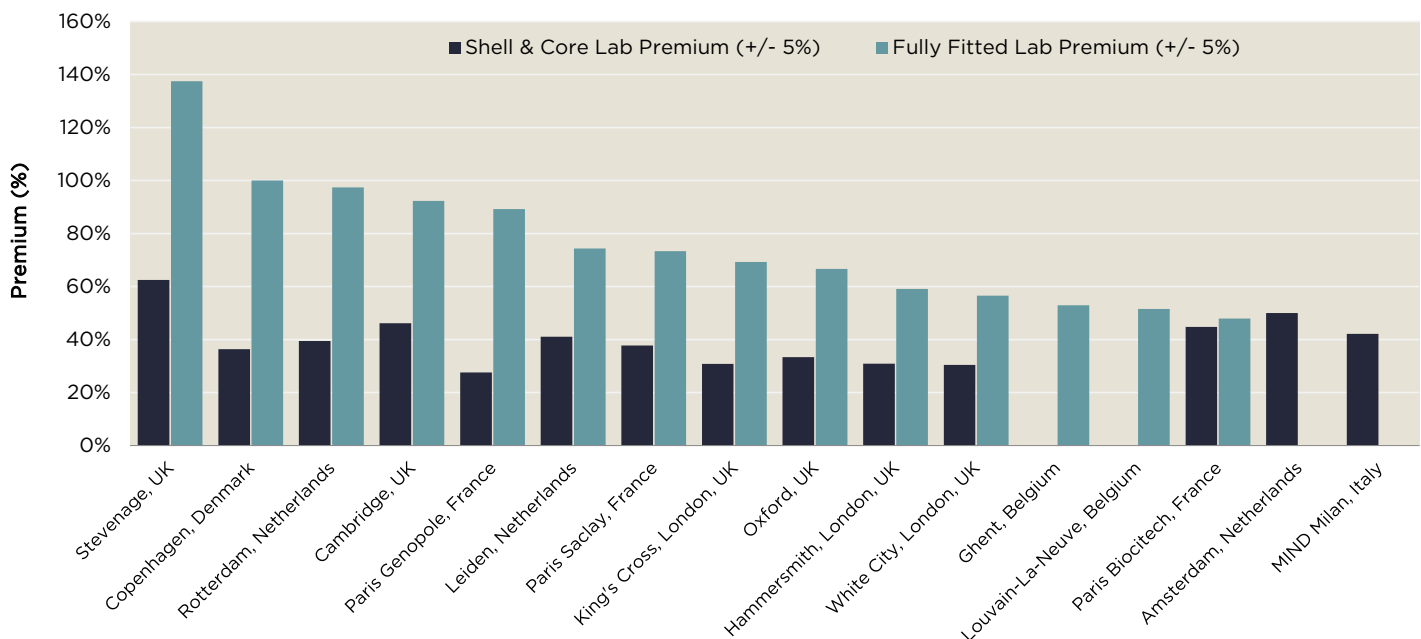
Methodology

Savills identified leading life science and innovation clusters across the UK and Europe. Savills Research, Leasing and Occupier teams compiled evidence to assess the prevailing office market rental tone for Grade A and B office stock in proximity to these key clusters. We then analysed the rental tone for both Shell & Core Lab space and Fully Fitted lab space to determine the rental delta. Where available, Savills benchmarked the rental tone with local management organisations (including incubators, governments, universities and hospitals).



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UK & European laboratory rent premiums



Source Savills

Notes: Premiums are from comparison to the office market. Shell and Core: Assumes the building base build technical specification is sufficient to house laboratory installations (M&E, Floor-to-ceiling, floor loading, vibration, extraction and air handling), together with a Cat A landlord contribution. Fully Fitted: Goes beyond the shell & core specification to include a generic Cat B fitout, often in incubator or grow-on spaces. No evidence sourced for fully fitted lab space in Amsterdam and Milan.

Flexible labs in the UK

2022 was a significant year for the provision of the incubator and grow-on flexible fitted lab spaces that the smallest early-stage companies so heavily rely on to start to progress their R&D.

In London, we saw ARC Group launch its new Motherlabs concept for serviced laboratories, which it plans to roll out across its portfolio. Imperial College & Blenheim Chalcot delivered space at Scale Space in White City. Both facilities offer labs from around 500-1,200 sq ft, attracting strong levels of interest and leasing up quickly. Kadans' new innovation centre at 20 Water Street of 38,000 sq ft is due to be finished in June, and British Land is on site delivering larger fitted grow-on labs from 4,000 sq ft at Regent's Place, Euston and Paper Yards, Canada Water.

We are seeing many other landlords, not just in the 'golden triangle' but across the UK keen to deliver this type of space but grappling with the challenges around build cost viability and operational support.

Overall, it is great to see more commercial landlords starting to provide this essential space and develop their own expertise and platforms for doing so.

For an example of where the flex laboratory is being delivered in mainland Europe, the article on this page presents Superlab Suisse and showcases its thinking, current operations, and rationale for a flexible solution.



Source Superlab Suisse

The role of flex

Real estate belongs to a very conservative industry which had not changed much in decades. Active innovation in real estate was limited, but this is different now.

A key driver is the sector's contribution to global carbon emission through construction and use. Around 40% of CO₂ emissions come from the built environment. A sharing economy in real estate will minimise the impact on the natural environment, immediately and enormously – avoiding new construction and reconstruction.

The commercial laboratory Superlab Suisse is born under this context and becomes part of the action. My architecture and construction company has been engaged in the design and construction of many pharmaceutical company headquarters and various laboratories for 15 years. One day I was thinking 'why are the pharma giants contracting us, and where are the small- and middle-size companies?'. I did some research and found that it turns out that with computer science, scientists are not more dependent on a big team. Any super talented PhD student can access a grant to prove

whether their idea is feasible in a short period of time, then they establish their own 'spin-off' or 'start-up'. On a macro level, the past few years, per annum, has seen around US\$60 billion of investment in early-stage life science companies, some of which must need labs.

So far, Superlab Suisse has three locations in Lausanne, Basel and Zurich, and it turns out that even medium and large companies and research institutions and universities, joined us as customers.

Flexibility in real estate has been a key trend in the past 20 years. But offering this flexibility of occupation, in a traditional laboratory, is very difficult. That is why we also reinvented the components, developed a new modular laboratory standard, and redefined operational flow of the commercial laboratory, to turn this complex into a viable business. This is so that scientists can just focus on their science and do not need to spend time on construction or operation. Life science companies, particularly start-ups, must deal with a lot of uncertainty and, therefore, a commercial flexible laboratory solution solves problems,

including the ability to upscale appropriately at the relevant time and not having to take space for anticipated future need rather than what is required immediately – this avoids wasted construction and/or fit-out and is, therefore, more sustainable, both environmentally and financially.

Laboratory real estate is a new asset class for a growing industry: when it comes to life science, you realise there is so much to be discovered – they all need lab real estate to conduct science. The science community is not only an ecosystem for science companies, but also a place to exchange ideas and share visions, where more collaboration and business are born. You can say, once this ecosystem is formed, it is stable, sustainable and irreplaceable; it is a living and breathing cluster, generating jobs, economic growth as well as discoveries for benefits to all.



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“ London seems to be roughly two years behind New York in terms of market maturity. Analysis is underway to look at the trajectory of growth across the two markets ”



London life science sector looks to New York for lessons on growth

The US has always been a bellwether for trends which then land in the UK, and this is no different when it comes to the evolution of the life science real estate sector. The US is the most mature market globally. Now, with the sharp increase in focus on the sector in the last three to five years, the London market is looking across the pond for insight and precedent.

Cambridge/Boston is indisputably the market leader. There is negligible vacancy and it has seen significant year-on-year value growth over the past 20+ years across 30 million sq ft+. For London, however, the emerging life sciences market in New York is probably a much more relevant comparison, given the closer physical, commercial and cultural similarities between the two cities. New York has nine academic medical centers; London has five teaching hospitals. There are six life science incubators in New York, and currently three in London.

As with London, New York's growing life science market has been catalysed by a number of factors: growth of the commercial health and science sector; impact of tech; scale of venture capital raised; increased urbanisation as big pharma changes to a more outsourced R&D model, and the real estate market seeing an opportunity to diversify away from the perceived pressures on the traditional office sector post-Covid-19.

In London, there is currently around 500,000 sq ft of existing commercial lab space and 950,000

sq ft consented and actively under construction. Of this, approximately 190,000 sq ft is lab space that has been converted from existing office stock. In New York, the life science market is approximately 1.9 million sq ft and is projected to grow to as much as 4.65 million sq ft by 2025.

The commercial science sector emerged here in the mid-2000s, with the New York State incubator opening in 2004 and the ground-breaking of the Alexandria Center for Life Science in 2007. In London, the London BioScience Innovation Centre was founded in 2000, the Francis Crick Institute opened in 2010, and Imperial College's I-HUB in 2016.

There was greater acceleration in scale in New York in those early years, probably due in part to the depth of the wider US pharmaceutical market and the nature of the US healthcare system. There is also a more established culture of commercialisation in the US, and a better-understood real estate underwrite of the sector. Those within both US and UK institutions have pointed to UK researchers' focus on academic recognition rather than commercial success as a drag on growth of the sector.

New York also leads on venture capital investment. There, a \$620 million state-wide life science initiative, combined with LifeSci NYC, a ten-year public funding commitment to growing its life science economy (launched 2016),

means more than \$1.5 billion has been pledged to help boost the ecosystem. There is nothing close to this in London.

New York also benefits from established specialist US life science developers, property companies and REITs, which have been solely focused in the sector within the US for many years. These specialist groups have established relationship networks within the science and R&D community, and a technical track record of space delivery, which provides confidence to occupiers. Life Science REIT is the first of its kind in the UK, and several UK development managers are establishing specialisms in the sector, such as Reef and Stanhope, but - so far - nowhere near the scale seen in the US. However, the fact that many of the established US names (as well as European and Asian groups) are now exploring and delivering schemes in London is an endorsement of its potential.

Where the capital has arguably shown greater strength than New York is in the initial focus on, and formation of, clusters. Whitechapel, London Bridge, Waterloo, King's Cross and White City all have both leading academic institutions and major teaching hospitals in situ. This combination of anchors has generated demand organically 'on site', and these institutions and their affiliated bodies are driving consolidation and commercialisation in and around the R&D, clinical and teaching prowess. This has drawn

in third-party companies seeking to attract and retain talent.

In contrast, while there is some sense of clustering occurring in areas such as Midtown East and Long Island City in Queens, elsewhere, life science projects in New York are generally opportunity-led. This is partly down to zoning. But with a greater degree of confidence in the value growth potential of the sector and the ability to get the specification right, there is also a mindset of 'build it and they will come' in New York. Anecdotally this has not always been the case, and there are more examples of vacant space in New York schemes. In London, this simply does not exist.

Generally, London seems to be roughly two years behind New York in terms of market maturity. Analysis is underway to look at the trajectory of growth across the two, and any correlation between rental premia, capital values and comparison to traditional office use. We will be watching closely to see the impact of new projects and occupiers in each market through 2023.



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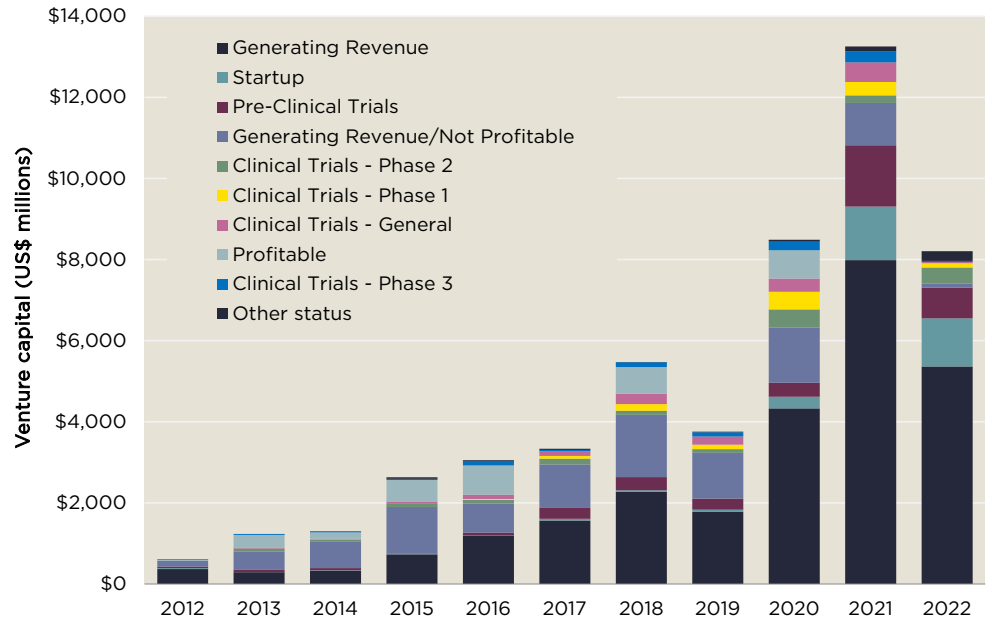
“ Life science companies are not shedding space like other industries in light of current economic uncertainty, keeping vacancy rates historically low and rents among the highest in the nation ”

View from the US

Companies such as Indigo Agriculture, Tessera, and Reify Health are among the most funded for this year. Over the summer, Indigo Agriculture, a developer of biopesticides intended to improve the safety of crops, raised an estimated US\$150 million in Series H funding from Empede Capital Partners and Timon Capital, placing the company’s pre-money valuation at about US\$3.8 million. In late February, Tessera raised US\$300 million from Salt Funds Management, TA Ventures and SoftBank Investment Advisers to accelerate its gene writing technology. Despite 2022’s trend of declining funding, life science companies are not shedding space like other industries in light of current economic uncertainty, keeping vacancy rates historically low and rents among the highest in the nation at an average of about US\$100 per square foot.

The total capital raising data showed an expected reduction in total raised to around US\$20 billion in 2022, for companies in Boston and Cambridge. 2021 was an exceptional year, with nearly US\$90 billion of transactions recorded driven by the US\$62 billion of M&A deals in 17 deals, with large acquisitions by Merck & Co, AstraZeneca and Novartis. The first two months of 2023 show signs of a much stronger year with nearly US\$9 billion recorded already, driven by Takeda’s acquisition of Nimbus Lakshmi, a subsidiary of Nimbus Therapeutics and is based in Seaport District.

Life science venture capital raised in Boston/Cambridge, MA Strong growth in 2021, with 2022 back at the “new normal”.



Source Savills, PitchBook Data, Inc. (Data has not been reviewed by PitchBook analysts)

Boston/Cambridge, MA

A key and mature life science market in the US

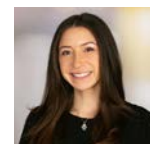
Boston remains the United States’ top life sciences cluster due to its proximity to world-class research centres, highly educated workforce, and large amounts of funding from venture capitalists and the National Institute of Health (NIH). Boston’s market contains several advantages for the life science industry with access to 25 hospitals, 20 health centres and world-class institutions such as Massachusetts Institute of Technology (MIT) and Harvard University. Boston is home to the Longwood Medical and Academic Area, a campus with over 46,000 scientists, researchers, and staff and over 21,000 students studying at its institutions and hospitals. This has helped maintain its high ranking in life science hubs across the nation and has led Massachusetts to become the number one state in Research and Development investment per capita.

The Boston metro area has seen an influx of new developments

in the past couple of years and has over 11 million sq ft under construction. Notable projects under construction include the first purpose-built life science development in Boston Landing, FORUM, a 350,000 sq ft life sciences building at 60 Guest Street being developed by Lendlease and Ivanhoe Cambridge, along with Greystar Real Estate’s 465,000 sq ft ‘74M’ at 74 Middlesex Avenue, set to deliver in spring of 2024. Throughout 2022, numerous life science buildings have been completed such as Breakthrough Properties ‘The 105’ a 263,000 sq ft lab and office development which will serve as CRISPR Therapeutics’ new headquarters.

For over two decades, Boston has received the most funding from the National Institute of Health (NIH) compared to any US city. Boston’s venture capital funding is also elevated compared to other markets at US\$8.22 billion year to date. However,

it has fallen from 2021’s peak of US\$18.24 billion and is still below 2020’s year-end total of US\$12.05 billion. The number of funding deals year to date is 331, down 46% from 2021’s 617 deals, and only one quarter left to make up the difference. Boston’s life science industry is made up of 14 sub-sectors, with Drug Discovery and Biotechnology among the most funded. Life science sub-sector Drug Discovery received the largest amount of funding in 2022 at US\$3.3 billion, about 40% of Boston’s year-to-date total. The second most funded was Biotechnology at US\$1.4 billion (17%).



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“Life sciences are increasingly embedding sustainability into their wider business policies and procedures”



ESG: The balancing act

The life science sector is, by nature, in a balancing act between environmental, social and governance (ESG) considerations. The outputs from the activities of companies operating within the industry deliver broad societal benefits and have the power to transform life on our planet. In parallel, life science companies are highly carbon-intensive in their operations, with the global pharmaceutical industry producing 55% higher emissions than the automotive industry, for example.

While most corporations are beginning to prioritise ESG, for those in the public eye, it is paramount to demonstrate commitment to environmental and social sustainability combined with good governance practices.

Companies operating within the life science sector are becoming increasingly conscious of the environmental and climate impacts resulting from their activities, with a large proportion of pharmaceutical and biotechnology companies adopting net zero carbon goals and setting emission reduction targets for 2030. This is particularly important for those with a large manufacturing and supply chain footprint. Large-scale R&D and manufacturing operations require specialist facilities, often with complex construction and fit-out requirements, and their activities are associated with high energy and water usage, and a heavy dependence on single-use plastics.

Indeed, laboratories consume up to ten times more energy per square metre than standard commercial office buildings. Equipment such as fume hoods and ultra-low temperature freezers can use as much energy as an average-sized household. Therefore, optimising space and its use can deliver a reduction in energy consumption that has the potential to deliver a significant relative reduction in carbon dioxide emissions and footprint.

In conjunction, challenges arise in that research spaces have complex operations with multiple service requirements, meaning that strategies typically used to optimise efficiency in commercial buildings are rarely suitable for laboratory environments.

Biological laboratories typically require operations with a range of thermal environments, while chemical laboratories require particularly high levels of ventilation, and in spaces with a high usage

of electronic equipment, the control of temperature, humidity and airborne pollutants is essential. Maintaining these controlled conditions is dependent on the building fabric and services. Building design and space planning can help to address these challenges, combined with strong governance practices to ensure transparency and robust decision-making, within a heavily regulated sector.

Increasingly, strategies are looking towards driving operational efficiencies, including optimising laboratory processes and equipment use, improving waste management and recycling, minimising water consumption and encouraging sustainable behavioural change.

Moreover, in addition to reducing greenhouse gas emissions and minimising their transition and physical climate risks, all companies must play a role in driving social value and demonstrate strong governance practices. Equity in the provision of healthcare is a core aim under the United Nations Sustainable Development Goals, and big pharma organisations have the power to influence global distribution networks and ensure equitable access to supplies.

Those operating within the life science sector are increasingly embedding sustainability into their wider business policies and procedures, and their strategies are broad reaching from employee inclusion and diversity to community engagement, and access and affordability of products, through to product quality and safety.

To attract these leading companies with responsible polices landlords must truly consider how to deliver space that reflects and addresses these ESG considerations.



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What is the Laboratory Efficiency Assessment Framework (LEAF)?

LEAF provides guidance and criteria to improve the carbon footprint of lab space. By taking part in this programme, lab users can utilise an online tool to assess their sustainability actions. LEAF also provides an in-built calculator to estimate a company's impact of its actions in both carbon and financial terms, as well as free training and resources to promote sustainable science.

LEAF Criteria

LEAF comprises five key categories of criteria for assessment: Waste; People; Sample and Chemical Management; Equipment, and Ventilation.

Using LEAF's online tool, lab users record their actions against the five key criteria for the award level sought, either Bronze, Silver, or Gold. LEAF reviews these submissions and presents an impact report if the lab is certified.



NHSA: Collaborating for healthcare

A new partnership between the North of England's health sciences ecosystem and Israel's high-innovation medtech sector is flourishing following innovation exchanges between the two countries.

Since 2017 the Northern Health Science Alliance (NHSA) has developed strong ties with the Israeli Innovation Authority (IIA) and the UK Israel Tech Hub. The potential of the two systems working closely together was recognised quickly and has led to a flurry of Israeli companies coming over to the North of England, bringing expertise.

NHSA Head of International Dr Ben Martyn explains: "Israel has a high-innovation economy with some truly groundbreaking tech which has huge potential to improve lives for patients in the UK. The North of England, with its excellence in clinical trials, universities and health research, offers a mutually beneficial environment in which to bring this technology into market."

The NHSA represents 24 organisations across the North of England, ten universities, ten NHS hospital trusts and the northern academic health science networks. A memorandum of understanding was signed between the NHSA and the IIA in May 2022, following a number of successful visits between the two countries. Over 50 companies have been in touch with the Northern ecosystem following the agreement, including a Leeds-Israel Innovation Healthtech Gateway.

Another of the partnerships to have been developed is between Rotherham, Doncaster and South Humber NHS Trust (RDaSH) and Israeli tech company Taliatz. Their new collaboration will see UK patients' mental health treatment supported by Taliatz's artificial intelligence (AI) software platform PREDICTIX. This offers clinical decision support tools and patient management for psychiatrists and GPs.

Taliatz is the first company to move forward rapidly in the UK as a result of Grounded Research's participation in a delegation from the NHSA to Biomed Israel earlier this year.

Combining medical science with AI, PREDICTIX translates complex genetic, demographic and clinical patient data into time-saving and cost-saving assessment, management and prescribing support tools for healthcare providers. PREDICTIX improves

first-time prescribing success, both saving time and costs for the NHS mental health services.

The new collaboration addresses the NHSA's delegation's aim to explore trends and breakthrough technologies with Israeli companies that have the potential to shape the future of the healthcare system, particularly in the world of mental health. The commercial partnership will allow for the integration of PREDICTIX into the NHS, and to improve mental health assessment and management. The Biomed Israel delegation was jointly organised by the Israel Foreign Trade Administration (FTA), the UK-Israel Tech Hub and the NHSA.

The need for innovation and vital investment in mental health across the North of England has recently been shown by the NHSA's Parallel Pandemic report, which found that mental health in the North was significantly worse than the rest of England over the course of the Covid-19 pandemic, with a £2 billion cost to the country.

Grounded Research Assistant Director, Heather Rice, said: "We are delighted to announce this collaboration. We hope, in time, it will make a real difference to the ability of professionals to prescribe immediately and effectively at the point of care. We are especially pleased that the collaboration will be putting mental health on the map in this exciting and innovative area of medicine, potentially revolutionising mental health assessment and management."

"The World Health Organization estimates that there is a four-fold return on digital solutions for mental health in improved health and productivity", said Dekel Taliatz, CEO and Co-founder of Taliatz. "This new partnership, focussing on improving the effectiveness and utility of mental health prescribing, has the potential to help hundreds of thousands of patients in the RDaSH area and a population of 17 million in the North of England alone. We are looking forward to expanding our efforts in the UK."

Ben Martyn continued: "This collaboration between Taliatz and RDaSH is recognition of the amazing clinical and research strengths we have here in the North of England and specifically the excellence of the grounded research team. Taliatz's innovative solution will deliver real benefits for

patients here and shows that there is global interest in investing in the North. The NHSA will continue to bring cutting-edge solutions to health problems to the UK and keep the North firmly as a global leader in the research, development and evaluation of health technologies."

The links between the North of England and Israel have been further developed thanks to another new initiative developed through its relationship with the IIA. A challenge has been put out to innovative Israeli companies to collaborate with NHSA members to solve key healthcare challenges. Part of the International Health Tech Partnership Programme, with the IIA, HealthIL, the Healthcare Innovation Ecosystem in Israel, NHSA member organisations are supported to select Israeli start-ups of interest and bid for project funding to run R&D or pilot projects.

The organisations will act as real-world living laboratories for the companies to test and improve an existing process, service, or product; or to apply a new process to healthcare for the first time.

Ronit Applebaum, Healthcare Innovation Sector Lead of the UK Israel Tech Hub, said: "We are delighted to be working on an excellent initiative to enable Israeli companies to develop, test, adapt and optimise impactful health technologies, at world-renowned hospitals in the North of England.

"Our partnership with the NHSA is going from strength to strength, thanks to our shared values, a passion for excellence and driving forward innovation to improve healthcare. We look forward to reviewing the applications and taking the project to the next stage."



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Savills Science

Science, R&D and technology sectors all demand specific types of real estate. Savills, using data and expertise across all markets and disciplines will help clients make the best real estate decisions. Savills have established offices, with science capability, within the key markets across the UK. Savills also has significant expertise in dealing with all aspects of science real estate, particularly for occupiers, within the key markets in EMEA, North America and Asia. Having a global understanding of these international markets, with experts 'on the ground', means that Savills can provide an enhanced offering to all types of clients, including occupiers, investors and landlords.

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