



JONES LANG
LASALLE®

Real value in a changing world

Life Sciences

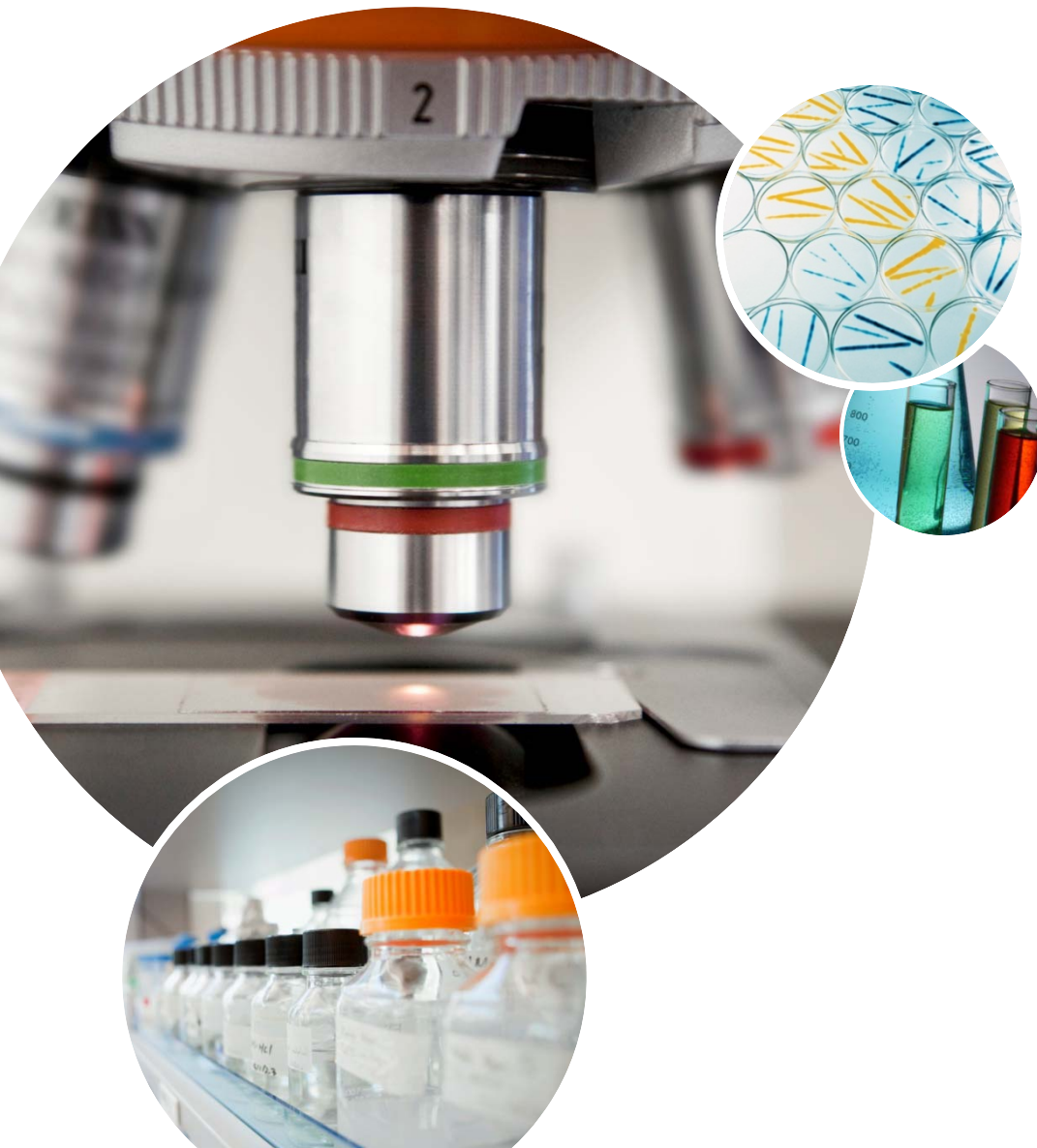
Cluster Report

Global . 2012

Portfolio optimization and strategic site selection are crucial for success in the industry's new reality

In the new reality for life sciences companies – one where the product development formula of the past no longer applies, where extensive M&A activity is needed to fill pipelines and mitigate risk, and where an increasing amount of attention and opportunity lie in emerging markets – prudent measures and strategic solutions are critical to succeed.

More than ever, it is essential to achieve the ideal portfolio balance, with the proper size and type of facilities in the right locations.





Global clusters

A review of established and emerging clusters within the three global regions of the Americas, EMEA and Asia Pacific

Americas

EMEA

Asia Pacific



Global themes

As the life sciences landscape continues to evolve, opportunities to optimize facility and real estate portfolios and site-select for enhanced innovation efficiencies emerge.

In the new reality for life sciences companies – one where the product development formula of the past no longer applies, where extensive M&A activity is needed to fill pipelines and mitigate risk, and where an increasing amount of attention and opportunity lie in emerging markets – prudent measures and strategic solutions are critical to succeed. Yet with all this change and uncertainty comes an immeasurable amount of opportunity.

Beyond the costs to develop new drugs and treatments, facility and real estate costs are among the highest expenses for life sciences companies, and are therefore top of mind as the industry refocuses and reprioritizes. The industry is challenged by the conflicting need to right size in mature markets, where sales and demand are waning and where M&A activity oftentimes results in excess or duplicative facilities, while strategically growing in emerging clusters in order to capture market share and savings opportunities. More than ever, it is essential to achieve the ideal portfolio balance, with the proper size and type of facilities in the right locations. Given that the industry is contracting in mature markets, creatively positioning dispositions and knowing how and when to hit the market, can greatly impact the timeline, and thus expense, of divestiture. Additionally, knowing in which locations to maintain and expand operations has major bearing on the ability to capitalize on skilled labor force and fiscal resources, and thus, efficiently achieve new product breakthroughs.

Location strategy in mature market clusters hinges on deep resources for innovation excellence

Established clusters in the United States, Europe and to some extent Japan realize that although the industry is increasingly looking to emerging markets for growth opportunities, much of the core R&D functions will remain domestic. It is also apparent that the industry is becoming more strategic with site selection, choosing locales with rich industry resources and capital and higher propensities for discovery and innovation. Although the mature clusters in the United States and Europe continue to be reliable choices, with deep and well-developed resources, emerging clusters within the United States and Canada are working feverishly to bolster their industry infrastructure.

Within the United States, the coastal cornerstone locales and certain mature clusters in EMEA continue to enjoy industry growth, oftentimes due to strong support from their world-class academic, healthcare and private sector institutions. Greater Boston, Philadelphia, New York City and Zurich

all reported development activity and demand from partnerships with area universities and hospitals. And although other established global clusters like the San Francisco Bay Area, San Diego, New Jersey, Seattle, Paris and much of the United Kingdom all reported constrained demand due to rampant M&A activity, each remain confident that their supportive industry infrastructure will furnish the resources and environment for new start-ups to backfill vacated space.

Economic development groups and public-private partnerships in emerging United States and Canadian clusters are making efforts to position their markets for success. Clusters like Westchester / New Haven, Central & Southern Florida, Indianapolis and Montréal offer targeted incentive packages and newly constructed, state-of-the-art incubator centers and parks specialized for the industry. Beyond incentives, each of these clusters are bolstered by research institutions and enjoy the same government-instituted regulations and protections; however, real estate in these clusters can be attained at a lower cost.

Emerging global economies strengthen R&D capabilities and infrastructure

Although emerging clusters in Asia Pacific and Latin America have been an industry choice for outsourced manufacturing for some time, the governments of emerging global economies are laser-focused on growing their high technology capabilities, due to increasing local demand and the positive impact they have on the economy and export revenue potential.

One of the biggest ways that emerging global clusters are increasing their competitiveness is through economic incentives and industry-dedicated funds. Clusters such as China, Brazil, India and Singapore all reported recent funding opportunities dedicated to the industry, and although many aim to ramp up the innovation potential of domestic start-ups, multinationals are able to capitalize on these offerings too, and have already done so in many cases. Additionally, nearly all the emerging global clusters cited have reported increased spending on overall public healthcare, widening the prospective patient pool and increasing consumer demand.

Beyond the fiscal resources directly available to industry companies, government and economic development group dollars have also supplied funds for prospective development projects that are

specialized to the needs of life sciences companies and start-ups. China, Singapore and Japan are home to some of the biggest government-funded life sciences parks and incubator centers.

The topic of globalization and movement into emerging economies always raises concerns over consistent and transparent regulations and intellectual property (IP) protection. In the past, emerging governments struggled to effectively outline and govern practices comparable to those in the United States and European Union. Knowing these issues are top of mind for multinational

firms, emerging governments are reacting quickly to improve their competitiveness in the global marketplace. India, for instance, has improved its patent protection laws with a signatory to the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights, and introduced GMP and ASEAN Common Technical Dossier guidelines to increase quality standards. Colombia continues to expand its Free Trade Agreements with global partners, which has an impact on important trade sectors, such as pharmaceuticals.

Global industry statistics

Cluster	Researchers in science, per thousand total employment ¹	Graduate students in science, engineering, manufacturing & construction, as a % of total graduate students ⁵	Gross expenditure on R&D, as % of GDP ⁷	Total patent applications, residents only ⁸
Brazil	1.4	12.2%	1.2%	2,705
Canada	8.5 ²	21.1% ⁶	1.9%	4,550
China	1.5	N / A	1.7%	293,066
Colombia	0.4	24.2%	0.2%	133
France	8.9	26.2% ²	2.3%	14,748
Germany	8.1	23.3%	2.8%	47,047
India	0.4 ³	N / A	0.8% ⁴	7,262 ⁹
Indonesia	0.2	21.7%	0.1%	N / A
Japan	10.5	21.9%	3.4%	290,081
Mexico	1.0	25.6%	0.4%	951
Netherlands	5.2	14.0%	1.8%	2,575 ⁹
Singapore	12.0	N / A	2.3%	895
Switzerland	6.0 ²	21.6%	3.0% ²	1,622
United Kingdom	8.8	21.7%	1.9%	15,490
United States	9.5 ⁴	15.3%	2.9%	241,977

Footnotes:

1. UNESCO, 2009

2. 2008 data

3. 2005 data

4. 2007 data

5. UNESCO, 2009

6. 2002 data

7. UNESCO, 2009

8. World Bank, 2010; includes total patents from all industries

9. 2009 data

Americas

Established clusters within the United States are undergoing varied effects from industry consolidation, while emerging clusters within the United States and the broader Americas region continue to enhance industry infrastructure and R&D capabilities.

At a time of overall austerity in the life sciences industry, established clusters within the United States are trending along one of two paths. Several clusters in the Northeast are enjoying impressive growth, demand and resultant real estate development, due in large part to partnership support from academic, healthcare and private sector institutions. Conversely, a larger number of established clusters are experiencing consolidation and diminished demand, in line with the expected aftereffects of M&A activity and streamlining of operations. Emerging clusters within the United States have adopted an “if you build it, they will come” mentality. Be it via targeted incentive packages or the construction of incubator centers and parks, economic development groups and public-private partnerships from emerging clusters are all making strong efforts for a seat at the table.

Canadian markets continue to trend similarly to emerging clusters within the United States as they realize gaps in funding and are trying to create incentives and solutions to support life sciences companies. Clusters within Latin America are acting quickly to meet the demands of the industry and local populations. With increased wealth and access to healthcare, the demand for drugs and medical care is rapidly increasing. Although Latin American clusters are traditionally viewed as manufacturing destinations by multinational firms, particularly due to geographic proximity to the United States, local governments are ramping up domestic R&D capabilities to hopefully increase the amount of drugs and treatments created locally. Additionally, strong efforts are being made to protect IP and to combat smuggling and counterfeit drugs.

United States

Established

Greater Boston
San Diego
San Francisco Bay Area
Raleigh-Durham
Philadelphia
Suburban Maryland / DC / Arlington
New Jersey / New York City
Los Angeles / Orange County
Minneapolis-St. Paul
Seattle

Emerging

Westchester / New Haven
Chicago
Denver
Cleveland / Columbus / Cincinnati
Salt Lake City
Dallas / Fort Worth
Southern Wisconsin
Central & Southern Florida
Indianapolis
Southern Michigan
Atlanta

Emerging

Canada
Brazil
Colombia
Mexico



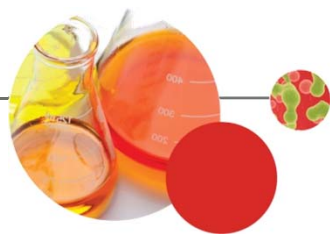
United States cluster methodology

The determination of U.S. industry clusters was first based off of a weighted ranking of state-level data. Qualitative knowledge of industry activity was used to amalgamate metropolitan areas into clusters. Quantitative data was used to rank individual clusters on their existing industry infrastructure and propensity to best support the industry.

	Life sciences employment ¹			Life sciences establishments ²			Biotechnology & medical device venture capital funding ³			National Institutes of Health funding ⁴			Weighting	
	30.0%			20.0%			25.0%			25.0%				
Cluster	%	Weighted score	Rank	%	Weighted score	Rank	\$ (in millions)	Weighted score	Rank	\$ (in millions)	Weighted score	Rank	Weighted score	Rank
Greater Boston	3.1%	22.4	2	1.4%	15.9	2	\$1,392.7	19.5	2	\$2,274.9	25.0	1	82.9	1
San Diego	4.8%	30.0	1	1.3%	14.3	3	\$602.0	15.1	3	\$871.7	14.0	8	73.3	2
San Francisco Bay Area	2.3%	18.7	5	0.8%	8.3	13	\$2,371.8	25.0	1	\$1,366.4	17.9	3	69.8	3
Raleigh-Durham	2.8%	21.0	4	1.8%	20.0	1	\$154.8	12.6	10	\$916.7	14.3	6	67.9	4
Philadelphia	2.1%	17.6	8	1.0%	11.1	6	\$246.6	13.1	8	\$824.1	13.6	9	55.4	5
Suburban Maryland / DC / Arlington	1.7%	15.9	9	1.0%	11.0	7	\$317.8	13.5	7	\$965.6	14.7	5	55.1	6
New Jersey / New York City	1.3%	12.3	14	0.7%	3.4	20	\$482.2	14.4	5	\$1,649.6	20.1	2	50.2	7
Los Angeles / Orange County	2.3%	18.4	7	0.5%	0.0	21	\$514.7	14.6	4	\$1,045.2	15.4	4	48.3	8
Minneapolis-St. Paul	2.9%	21.2	3	0.9%	10.0	11	\$209.3	12.9	9	\$290.1	3.7	18	47.8	9
Seattle	1.4%	12.7	13	0.8%	8.0	15	\$101.7	8.2	12	\$885.3	14.1	7	43.0	10
Westchester / New Haven	2.3%	18.7	5	0.9%	10.0	11	\$62.3	4.0	15	\$443.5	7.2	14	39.8	11
Chicago	1.2%	9.8	15	0.7%	4.3	18	\$141.6	12.5	11	\$682.0	12.5	11	39.1	12
Denver	1.7%	15.8	10	1.1%	12.8	5	\$79.8	5.9	14	\$318.7	4.4	17	38.8	13
Cleveland / Columbus / Cincinnati	1.1%	8.2	17	0.9%	10.1	10	\$92.4	7.2	13	\$687.3	12.5	10	38.0	14
Salt Lake City	1.5%	14.5	12	1.3%	14.1	4	\$25.2	0.0	20	\$162.1	0.9	20	29.5	15
Dallas / Fort Worth	0.9%	5.6	19	0.7%	6.0	17	\$331.6	13.6	6	\$224.4	2.3	19	27.4	16
Southern Wisconsin	1.1%	8.9	16	1.0%	11.0	7	\$36.2	1.2	17	\$399.1	6.2	15	27.2	17
Central & Southern Florida	1.0%	6.8	18	0.8%	7.1	16	\$47.1	2.4	16	\$465.5	7.7	13	24.0	18
Indianapolis	1.5%	15.0	11	0.8%	8.3	13	\$25.2	0.0	20	\$123.8	0.0	21	23.3	19
Southern Michigan	0.5%	0.0	21	0.9%	10.2	9	\$27.9	0.3	19	\$655.5	11.9	12	22.4	20
Atlanta	0.7%	3.3	20	0.7%	3.7	19	\$36.2	1.2	17	\$373.0	5.6	16	13.8	21

Footnotes:

1. Bureau of Labor Statistics, 2011
2. Bureau of Labor Statistics, 2011
3. PricewaterhouseCoopers / MoneyTree Report, 2011
4. National Institute of Health / Awards by Location, FY 2011



1

Greater Boston ranks No. 1 among U.S. life sciences clusters, bolstered by its efficiency, collaboration and intellectual prowess.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Within the United States, life sciences-focused clusters are at various stages in their evolution. The Northeast and California continue to dominate with their extensive university networks and deep labor pools, but, more and more, emerging clusters offer great talent coupled with more competitive real estate opportunities.

Greater Boston market overview

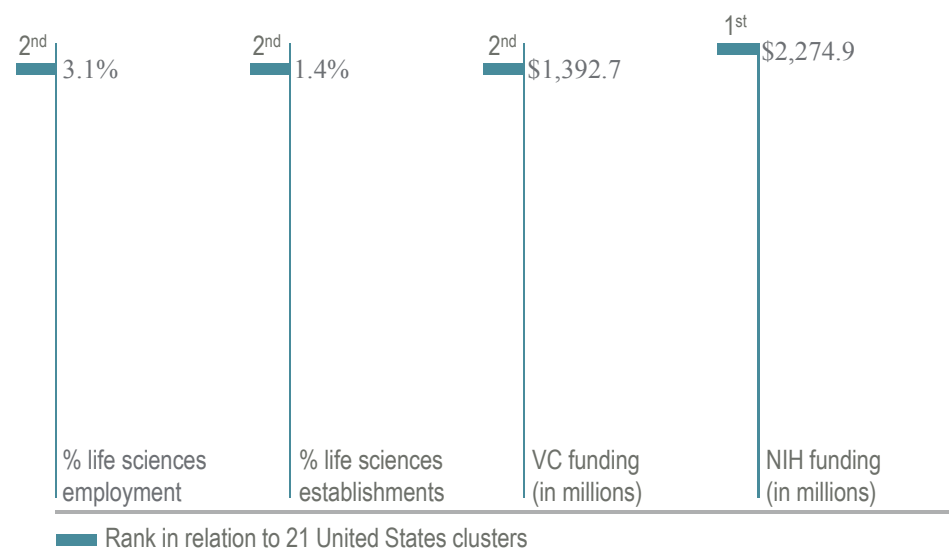
With the drive for discovery and innovation causing a rebalancing of operations, the Boston market continues to benefit from global realignment. The discovery process demands efficiency, collaboration and intellectual prowess. Boston is the elite provider creating that element of

connectivity and is fueled by top-notch universities, innovation centers, research hospitals, venture capital firms and, most importantly, a strong labor force.

The Boston MSA features more than 74,000 employees within the pharmaceutical, biotechnology and medical device subsectors of the industry, trailing only San Diego on a percent of total workforce basis. Additionally, the area is the leading recipient of National Institute of Health (NIH) funding. Massachusetts is home to five of the top eight NIH-funded hospitals in the United States, which act as global leaders in biotechnology research. The top five NIH-funded universities (Harvard, University of Massachusetts, Boston University, MIT, and Tufts) anchor this cluster and offer advanced degrees in biosciences, fuel employment in the industry and add great depth to the development of innovative products.

The Greater Boston life sciences industry includes geographic markets that are both established and emerging. Cambridge is the state's core life sciences cluster. Here, large biopharma companies intermingle with start-ups, who begin here and grow until they are acquired or relocate as they outgrow space options. While Cambridge is a mature market, there are multiple emerging markets outside of the city attracting attention. These emerging clusters include the Greater Boston Suburbs, the Seaport District and the Longwood Medical and Academic Area (LMA).

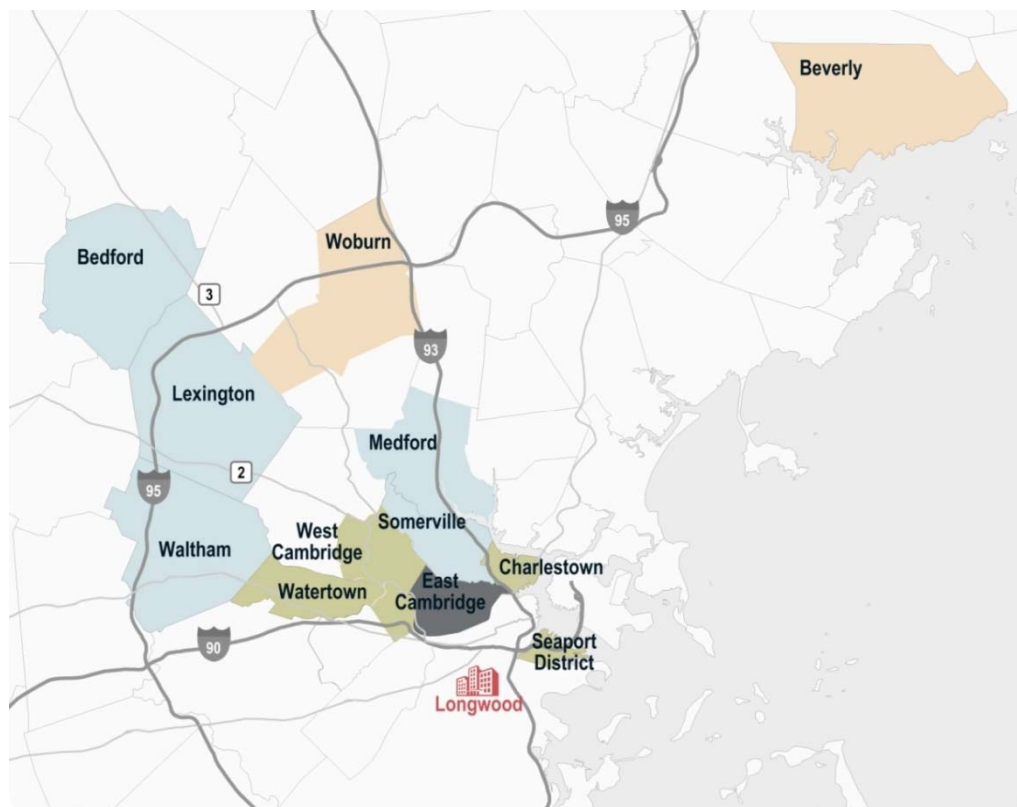
Greater Boston life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

The *ripple* effect of East Cambridge

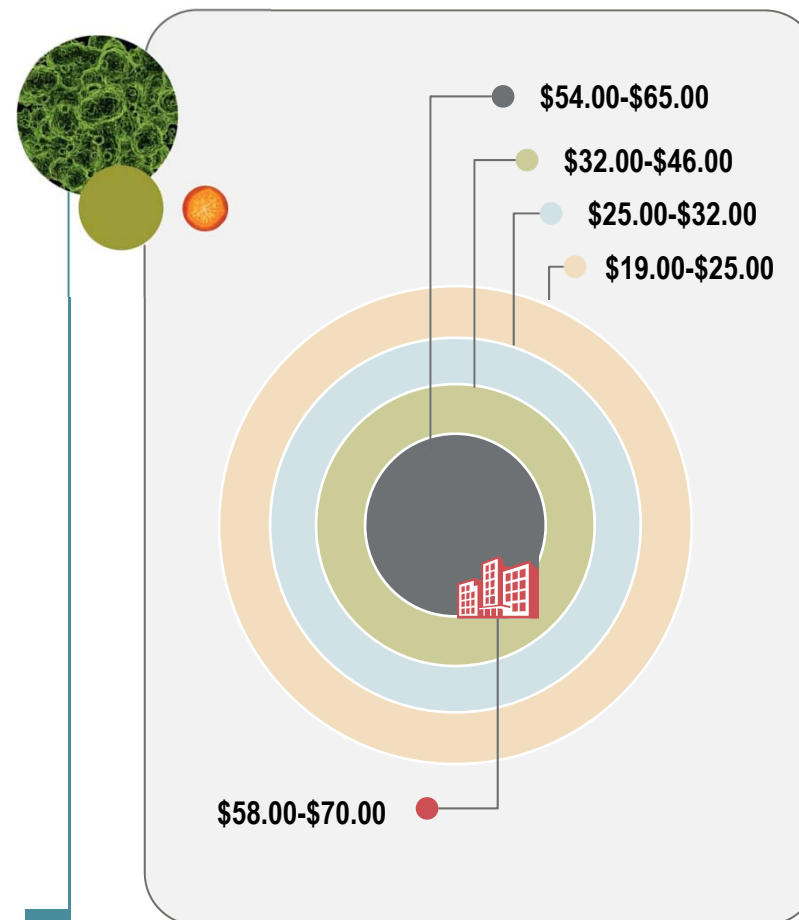
The Jones Lang LaSalle life sciences rent ring



Rent ring

The concept of the rent ring is built on the understanding that the Greater Boston life sciences industry stems from East Cambridge. This market has become incredibly dense, with just over 7 million square feet of lab space in less than a 1.5-mile radius from the Kendall Square MBTA Station. As a result, this market is extremely competitive, with few growth options and asking rents reaching as much as \$65.00 per square foot NNN for trophy spaces. East Cambridge represents the bull's-eye, the center of the ring, where rents are highest. Consequently, demand begins to spill outward.

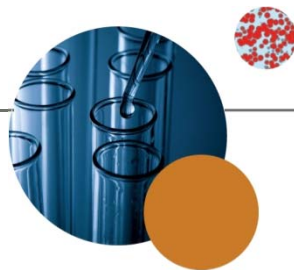
Asking rents are lowered as tenants begin to look right outside of East Cambridge, in West Cambridge and Watertown to the west and Charlestown and the Seaport District to the east. These markets are far less dense and act as emerging clusters. Here, asking rents vary from \$32.00 to \$46.00 per square foot NNN, still high, but considerably lower than East Cambridge rates. The next



step outward are suburban towns of Bedford, Lexington, Waltham, Medford and Somerville. Again the landscape changes dramatically, where lab space is considerably less clustered, but with lower rents ranging from \$25.00 to \$32.00 per square foot NNN. Farther out sit Woburn and Beverly, where asking rents range from \$19.00 to \$25.00 per square foot NNN. The Longwood Medical and Academic Area remains a unique outlier in the rent ring, where rents are often higher than those of East Cambridge (\$58.00 to \$70.00 per square foot NNN) due to its downtown location and proximity to healthcare institutions. However, the size of the leasable lab market in LMA is significantly smaller than East Cambridge, and does not have the same effect on the overall Greater Boston life sciences market.

The next sections present a deeper dive into each of these clusters, and how each falls into the life sciences rent ring.

Cambridge



Overview

At the heart of the Greater Boston life sciences market is Cambridge, holding nearly 7.5 million square feet lab space. The city acts as a global anchor for the industry, making it one of the most competitive and resilient markets in the nation. Cambridge maintains a true advantage as it is home to major academic institutions and centers of excellence, all within minutes of each other. Harvard University and the Massachusetts Institute of Technology fuel a strong labor force. Large private institutions like the Whitehead Institute and the Broad Institute nurture innovation and promote collaboration. Venture capital firms support industry growth and continue to locate in Kendall Square. And intertwined throughout all these entities are the life sciences companies, from start-ups to mature corporations, who continue to benefit from co-locating.

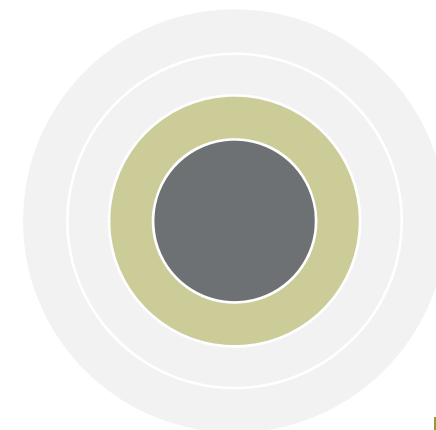
Real estate costs are higher in Cambridge but the proximity to outstanding intellectual capacity and the higher probability of discovering the next profitable drug outweigh the premium. Average asking rents in the Cambridge lab market have now reached levels of the last market peak at \$55.00 per square foot NNN. Cambridge lab rents are one of the first in Greater Boston to fully recover, and have proved resilient during the real estate bust, only dipping approximately 16.0 percent off peak.

Cambridge currently holds nearly 2.0 million square feet under construction, all dedicated to the life sciences industry. Although the majority of developments are build-to-suits, the city is home to the only speculative lab development in the country. Skanska is constructing 123,000 square feet of lab space at 150 Second Street. This spec development speaks to the confidence in the market. The remaining 1.7 million square feet, sponsored by large life sciences conglomerates, big pharma and local research institutes, is 95.0 percent preleased. *[Please refer to development map on next page for more details].* Historically, Cambridge has had minimal options for start-up or niche pharmaceutical companies seeking lab space. More and more developers are looking to meet this demand through the “rent-to-bench” model, where companies requiring very little space can rent turnkey, short-term lab space as their needs require.

All this activity is consolidated to East Cambridge, which already accounts for the vast majority of inventory. Across town, West Cambridge acts as an extension of the East Cambridge life sciences sector and continues to develop its own identity. The area boasts more of a suburban, campus-like feel, compared to the urban East Cambridge. West Cambridge provides a unique opportunity for large or growing tenants who are looking to experience cost savings and still maintain access to the renowned resources in Cambridge. Here, flexible zoning policies have been implemented to facilitate the development of lab space. As West Cambridge continues to form a cohesive identity, the submarket will see greater tenant demand and stronger market fundamentals.

Cambridge rent ring

- Average asking rents across the Cambridge lab market have now reached levels of the last market peak at \$54.61 p.s.f. NNN
- Trophy lab rents in East Cambridge can reach up to \$65.00 p.s.f. NNN
- West Cambridge asking rates are substantially lower at \$34.00 to \$46.00 p.s.f. NNN



IRONWOOD

Ironwood Pharmaceuticals signed an amendment to its lease at 301 Binney Street. Due to this lease extension and phased expansion for 93,000 s.f., Ironwood will now occupy a total of 303,000 s.f.

2M SF UNDERWAY

East Cambridge boasts nearly 2M s.f. under construction, including the country's only speculative lab development. The remaining 1.7M s.f. is 95.0 percent preleased.

FRESH POND RESEARCH PARK

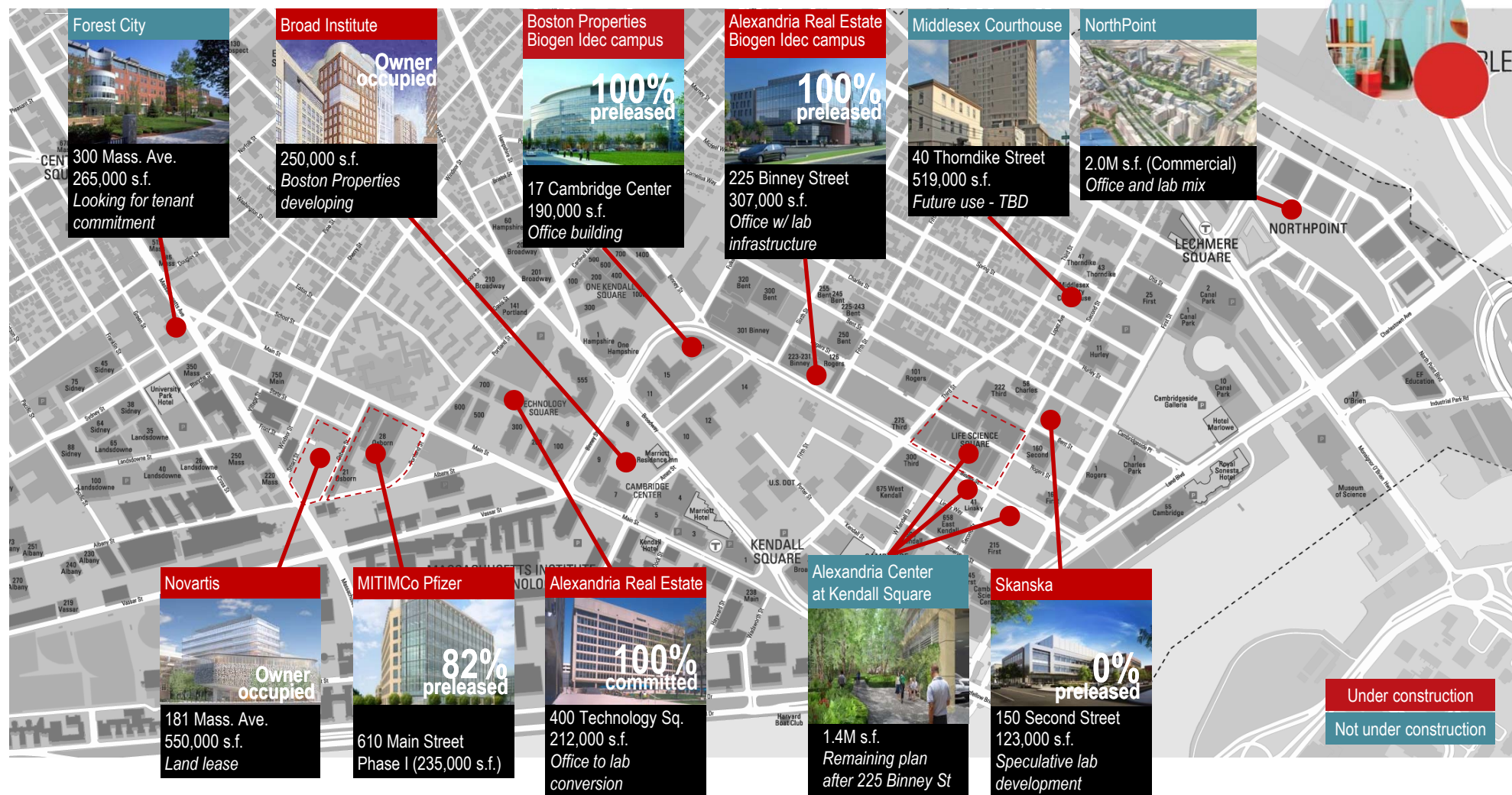
The Davis Co. bought the mixed-use 207,000 s.f. portfolio from Spaulding & Slye Investments. It sold for \$38.4M (\$185 p.s.f.); it represents a development opportunity for lab space in West Cambridge.

BOSTON BIOMEDICAL

signed a 63,000 s.f. lease at recently delivered 640 Memorial Drive. The lab building is now 79.0 percent preleased.

Cambridge acts as a global anchor for the industry, making it one of the most competitive and resilient markets in the nation.

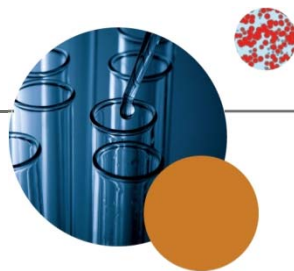
Cambridge development



Outlook

Cambridge will remain a stronghold for the life sciences community, and thus will remain extremely competitive. Although average asking rents are quite strong in the Cambridge lab market, the vacancy rate still remains relatively high (13.0 percent) compared to the Cambridge office market (7.3 percent). There are seven blocks of available space over 100,000 square feet if one includes 150 Second Street which is slated to deliver at the end of this year.

However, it is expected that lab demand will continue to grow and help to fill these spaces. Users seeing 200 to 300 percent growth projections are poised to expand into these larger blocks of space, where start-up and mid-tier organizations will continue to absorb the remaining space within this world class R&D hub.



Suburbs

Overview

Developers and tenants alike have recognized that the suburbs provide an important option for tenants finding space and pricing constraints in Boston and Cambridge biotech markets. As Cambridge presents an inefficient and undesirable supply of second and third generation laboratories, the suburbs provide a sound alternative where developers are delivering office-to-lab conversions as well as ground-up construction. Although less concentrated than the East Cambridge hotbed, there is a definite life sciences identity evolving along Route 128. Historically, the suburbs have served to support growing manufacturing and back-office functions. Today, more and more life sciences tenants are choosing the suburbs as their core location. The following highlights suburban cities that are benefitting from Cambridge spill-over demand.

Watertown acts as an extension of West Cambridge, with Alexandria Real Estate Equities owning the majority of the lab market share. Although technically a suburb, Watertown's existing infrastructure and strong accessibility has allowed a lab market to develop in the Arsenal area. The latest notable transaction was from Forma Therapeutics, who relocated to 45,000 square feet at 500 Arsenal Street.

Farther west sits Waltham, home to both mid-tier and global organizations. Noteworthy companies located in Waltham include AstraZeneca, Genzyme and Alkermes. With an established office market fostered by the high-tech industry, these firms are attracted to the existing amenities provided by the Route 128 corridor.

The Lexington / Bedford area is arguably the most active life sciences market in the suburbs. A number of tenants have recently relocated from Cambridge, taking advantage of the direct connection Route 2 provides to the area from the city. Major companies include Joule Biotechnologies, BioScale, Quanterix, Abpro and T2 Biosystems. Alternatively, Dyax signed a 45,000-square-foot lease at 55 Network Drive in Burlington, which should help connect this city to the Lexington / Bedford life sciences market.

Demand is spilling out of Lexington and Bedford into Woburn and Beverly, where Cummings Properties has developed a critical mass of lab supply. Tenants of all sizes, from start-ups to large companies, can find suitable space to meet their business goals. Farther south, Medford and Somerville are largely driven by start-up activity, where small companies are seeking economic relief in reduction of operating spending.

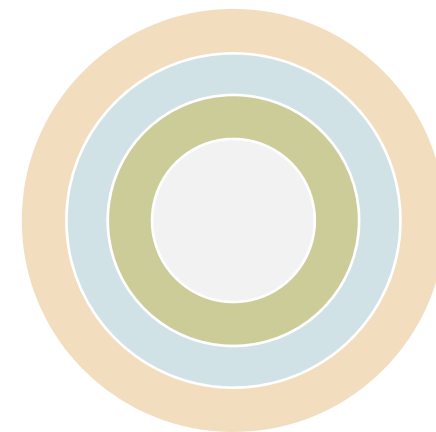
Outlook

Across the suburban market, redevelopment of flex-type properties into Class B laboratory facilities is popular, offering space at an attractive price point. Tenants looking for desired Class A lab space will consider build-to-suit options with landlords providing opportunities for asset conversion. With tenant demand driving this repositioning, non-core life sciences landlords typically require tenant commitments to ensure they receive their return on investment.

Suburban rent ring

Average asking rents for lab space varies across the suburban landscape

- Watertown rents mimic those of West Cambridge at \$32.00 to \$46.00 p.s.f. NNN
- Lexington / Bedford rates range from \$26.00 to \$32.00 p.s.f. NNN, Waltham has similar asking rates at \$25.00 to \$27.00 p.s.f. NNN
- Somerville / Medford incubator rents range from \$25.00 to \$32.00 p.s.f. NNN
- Woburn and Beverly rates are slightly lower at \$19.00 to \$25.00 p.s.f. NNN



1366 TECHNOLOGIES

The manufacturing solutions company signed a 41,000 s.f. lease at 6-8 Preston Court in Bedford. The tenant is relocating and expanding from 45 Hartwell Avenue in Lexington.

64 GROVE STREET

A 59,925 s.f. research facility (70.0% lab) in Watertown. Currently owned and occupied by Boston Biomedical Research Institute, which is looking to sell the property as a potential leaseback.

9 CROSBY DRIVE

Entegris purchased the 80,000 s.f. Bedford building from Duffy Properties for \$7.1M, or \$89 p.s.f. The company plans to convert the flex property to lab space.

DYNASIL

This Watertown tenant is seeking approximately 50,000 s.f., half of which will be devoted to R&D and products manufacturing and the other half to office.

The Greater Boston Suburbs provide a variety of lab growth options for space users at an attractive price point.

Seaport District



Overview

The Seaport (“Innovation”) District has attracted a variety of users due to its proximity to downtown Boston and the rental savings to be found in contrast to surrounding hubs such as Cambridge. The most notable relocation is Vertex Pharmaceutical’s decision to leave Cambridge and construct its new 1.1 million-square-foot office/lab headquarters by the end 2013. This colossal move fueled immense interest in the Seaport District for many life science tenants, both large and small. Due to rising popularity of this neighborhood, the landscape has changed with market rents rising and space options becoming few and far between. As a result, the Seaport District has quickly transformed into a very tight market where, over the past two years alone, over 14.5 percent of Seaport supply has been absorbed. Minimal space options remain for small and large tenants alike and thus recent lab activity has begun to slow.

Outlook

Given the current state of the Seaport District, and a forecast for only a tightening market, sizeable life sciences tenants will have to consider build-to-suit options here. As the existing landscape and infrastructure of the area continues to transform, build-to-suit options may become more and more attractive for established life sciences tenants.

ACETYLON

signed for approximately 10,000 s.f. at Seaport Center.

VERTEX

1.1M s.f. office/lab headquarters to deliver by end of 2013.

VERTEX

signed additional lease at One Harbor Street for 98,000 s.f., where space will be retrofitted to lab.

FUTURE DEVELOPMENTS

Life sciences activity in the Seaport District hinges on build-to-suit developments from established tenants.

Growing life sciences companies are opting to head off to try the new frontier of the “Innovation District,” where tenants can locate close to downtown and see some possible cost savings.

Longwood



Overview

The Longwood Medical and Academic Area (LMA) is one of the world’s premier medical, research and academic communities. This 213-acre site is comprised of 18.1 million square feet, where all buildings are institutionally owned with the exception of only two properties: BioMed Realty Trust’s Center for Life Sciences at 3 Blackfan Circle (703,000 square feet) and Merck’s Longwood Research Facility (466,000 square feet). Since Merck owns and occupies this building, it is truly only the Center for Life Sciences that constitutes the commercial leasable market. To meet the growing demand for leasable lab space, National Development and Alexandria Real Estate Equities are constructing a 413,000-square-foot research and development building at Longwood Center. Dana Farber signed on as the anchor tenant, agreeing to lease 154,000 square feet (37.3 percent).

Outlook

Others are also looking to expand their LMA lab footprint. Brigham and Women’s (BWH) is building 358,000 square feet on the former Mass Mental Health Center site. They recently completed a long-term ground lease in order to construct 360,000 square feet of office and lab space from Emmanuel College. Children’s Hospital announced plans for a new 445,000-square-foot clinical building in the heart of its campus and also has long-term plans to develop a 440,000-square-foot office and lab building a block from its campus. Adjacent to Longwood Center, the Winsor School plans for a third-party development of over 300,000 square feet on their “endowment” portion of its campus.

DANA FARBER

signed on as anchor tenant (154,000 s.f.) at Longwood Center (413,000 s.f.) with National Development and ARE.

BWH

will build 360,000 s.f. lab building on Emmanuel College campus and a new clinical & research facility on former Mass Mental Health site.

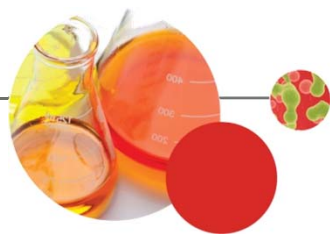
CHILDREN’S

The hospital is planning to construct a 445,000 s.f. clinical building on-campus and a 440,000 s.f. office and lab building adjacent to campus.

WINSOR SCHOOL

is planning third-party development of over 300,000 s.f. on “endowment” portion of campus.

The LMA is the second largest employment district in the state, surpassed only by downtown Boston. It is home to four of the top five hospital recipients of NIH funding.



San Diego ranks No. 2 among U.S. life sciences clusters, supported by its collaboration, cohesiveness and academic prowess.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the innovation formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Within the United States, life sciences-focused clusters are at various stages in their evolution. The Northeast and California continue to dominate with their extensive university networks and deep labor pools, but, more and more, emerging clusters offer great talent coupled with more competitive real estate opportunities.

San Diego market overview

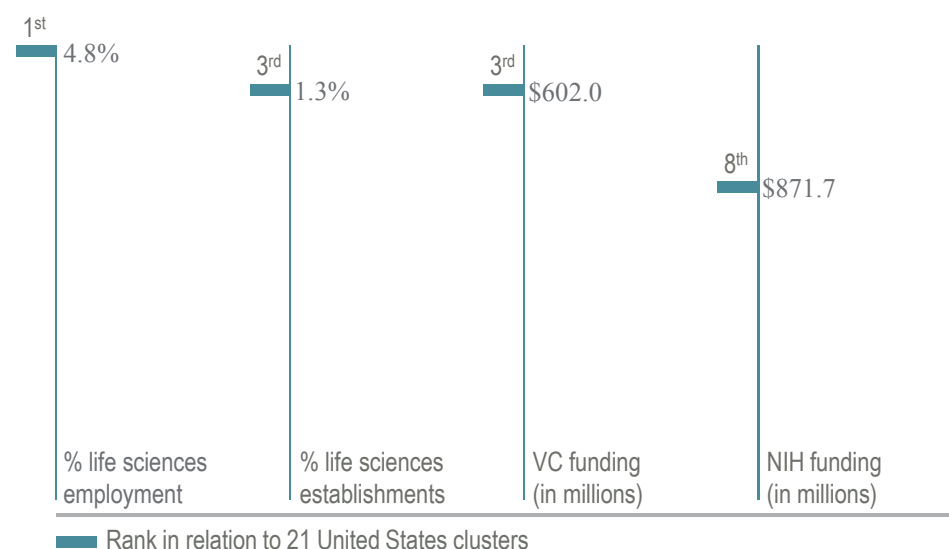
M&A activity continues to create a buzz in the San Diego life sciences sector. During the past 12 months, the local market has recorded a staggering \$13.8 billion in M&A activity among eight deals. Blockbuster deals completed in the most recent quarter included AstraZeneca's acquisition of

Ardea Biosciences for \$1.3 billion, Hologic's purchase of Gen-Probe for \$3.7 billion, and Bristol-Myers Squibb's offer to purchase Amylin Pharmaceuticals for \$7.0 billion. Not to be forgotten was Illumina fending off Roche's \$6.7 billion takeover, which died after Roche let its offer expire in late April.

But how will this swell in M&A activity affect the local real estate market? Will San Diego be left with a surplus of available space, much like what happened in the previous decade when a number of Big Pharma firms pulled out of town? It appears that AstraZeneca will keep Ardea in its San Diego facility while the company completes Phase III testing of its lead drug candidate. Amylin, who leases over 400,000 square feet in UTC, has yet to receive direction from Bristol-Myers Squibb on what will happen with its real estate.

With a number of questions still pending on the Amylin and Ardea facilities, the life sciences real estate market had exceptionally slow leasing activity. Some positive news came with Shire Pharmaceuticals (who acquired Advanced Biohealing in 2011) finalized negotiations with BioMed Realty for a build-to-suit campus in Sorrento Mesa. The company's initial plan is to construct a 170,000-square-foot facility to house manufacturing, warehouse and other related uses, with the site providing planned growth of up to 800,000 square feet. Shire will continue to operate its 85,000-square-foot Torrey Pines facility in addition to the build-to-suit, and the company is currently in negotiations to expand into an adjacent Torrey Pines project to accommodate immediate growth. Additional leasing activity included Takeda expanding into 43,000 square feet of office space in Torrey Pines and ACON labs renewing in its 17,000-square-foot Sorrento Mesa facility.

San Diego life sciences scorecard

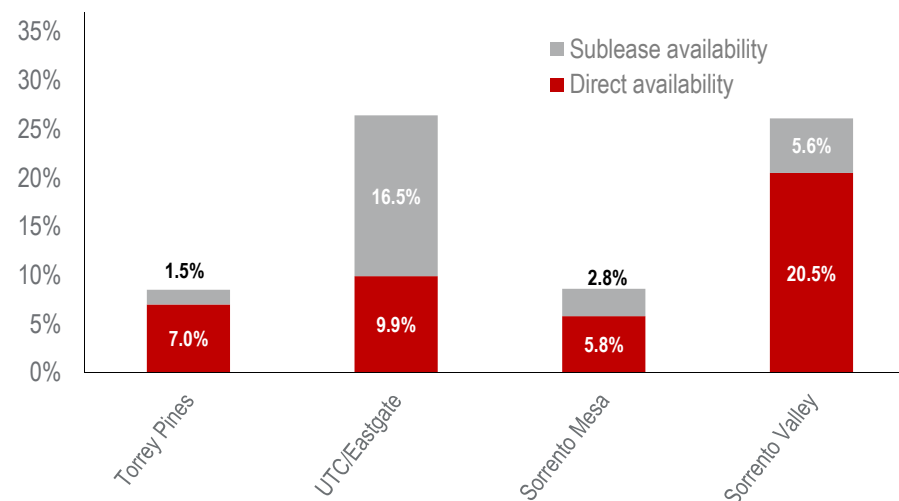


Life sciences market analysis

Trailing M&A activity

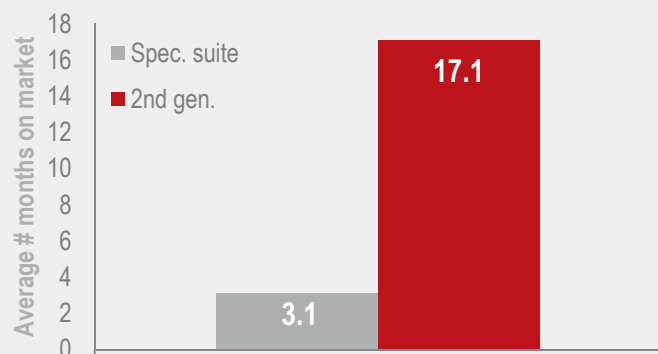
Date	Transaction Parties	Price
June 2011	Advanced Biohealing sale to Shire	\$750M
July 2011	Amira sale to Bristol-Myers Squibb	\$325M
October 2011	Anadys sale to Roche	\$230M
November 2011	eBioscience sale to Affymetrix	\$330M
December 2011	Intellikine sale to Takeda	\$190M
April 2012	Gen-Probe sale to Hologic	\$3.7B
April 2012	Ardea sale to AstraZeneca	\$1.3B
August 2012	Amylin sale to Bristol-Myers Squibb	\$7.0B

Submarket availability



Submarket Outlook

Time on market analysis: spec. vs. 2nd gen. suites

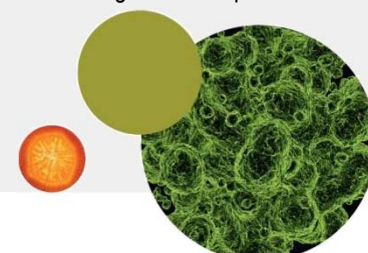


Submarket summary / market outlook

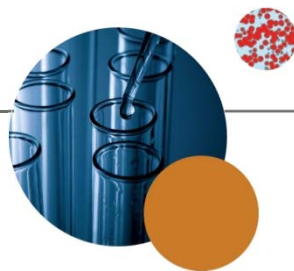
The second quarter's availability rate for San Diego's life sciences market (Torrey Pines, UTC, Sorrento Mesa, Sorrento Valley) was 13.4 percent, rising 70 basis points from the first quarter.

The increase in total availability was primarily due to a sharp rise in sublease space. Back in May, Sapphire Energy listed its 79,000-square-foot building for sublease and Amylin formally listed 71,500 square feet of specialty lab space to the market. Direct availability on the other hand recorded a small drop during the quarter, spurred on by some leasing activity in Torrey Pines and UTC / Eastgate.

Rental rates continued to rise across all submarkets. Sorrento Valley, which has historically been the "low rent" submarket, is seeing rental rates in the \$2.25-\$2.50 per square foot per month NNN range. Landlords continue to modernize antiquated space and have realized a sharp increase in rates as well as transaction volume when compared to second generation space that is left untouched, as highlighted in the graph to the left.



Torrey Pines



Overview

Torrey Pines is home to San Diego's largest concentration of lab space with over 5.0 million square feet. The submarket is adjacent to the UC San Diego campus and acts as the epicenter of San Diego's life sciences market. It boasts occupancy by a number of acclaimed research institutes, some of the world's largest pharmaceutical companies and a number of successful biotech companies that range from start-ups to mature corporations.

Torrey Pines has experienced relatively light leasing activity among its lab product. The first half of 2012 only recorded 75,684 square feet of transaction activity, down from the 2011 first half total of 169,000 square feet. On the other hand, the submarket's small supply of available space has been very active during the second quarter, highlighted by Takeda Pharmaceuticals expanding into 43,200 square feet of additional space as it relocated its San Francisco workforce to San Diego.

Outlook

After a relatively quiet first half of 2012, activity in Torrey Pines is anticipated to increase during the second half of the year, both on a positive and discouraging front. The month of July has already seen Vertex Pharmaceuticals complete a six and a half year renewal in its 81,000-square-foot facility. Additionally, Shire Pharmaceuticals and Sequenom have requirements to fulfill immediate expansion needs. Perhaps the most significant news is Pfizer's recent sale of three campus buildings, which together total 307,000 square feet. The sale closed during the third week of August and will bring a flood of new supply to the submarket and cause the total availability rate to surge by some 480 basis points to 13.3 percent.

Key market indicators

Inventory		5,339,591 s.f.
Total availability		8.5%
Direct availability		7.0%
Sublease availability		1.5%
Asking rents		\$2.95-\$3.75 NNN/s.f./mo.

Change quarter-over-quarter



LEASING ACTIVITY

Takeda Pharmaceuticals
43,159 s.f. (100% office)
Shire Pharmaceuticals
40,864 s.f. (100% office)
Zenobia Therapeutics
1,340 s.f.

4 BTS DEVELOPMENTS

Spectrum 160,000 s.f.
Sunrise 155,000 s.f.
10265 Science Center Drive 65,756 s.f.
10285 Science Center Drive 39,335 s.f.

PFIZER CAMPUS

Legacy Partners was the buyer of CB5, CB6 and CB7, totaling 307,000 s.f. All three buildings were sold vacant. The space had been on the market for 12 months and closed on August 14.

5 BIOTECH REQUIREMENTS

Sequenom is in the market for 25,000 s.f., Wellspring Biosciences is out with a 12,000 s.f. requirement, Anaphore and Dermtech are both out for 7,000 s.f. and BioEdge for 3,500 s.f.

This quarter's biggest news: Pfizer's sale of three campus buildings, that together total 307,000 square feet.

Activity key:

Leasing

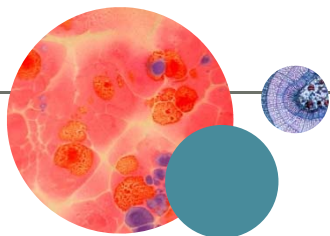
Development

Sales

Tenants in the market

Large blocks of space

UTC / Eastgate



Overview

The UTC / Eastgate submarket, like Torrey Pines, is comprised of mature, publicly traded companies with advanced product development. This submarket, which offers the most direct competition to Torrey Pines, has 2.3 million square feet of lab space and is located in San Diego's "Golden Triangle," which offers numerous amenities to tenants. Eli Lilly, Illumina, Bristol-Myers Squibb (Amylin Pharmaceuticals) and Celgene are the submarket's largest users, together leasing 1.4 million square feet of space or 61 percent of the submarket's total life sciences inventory.

Transaction activity in the UTC / Eastgate market has been slow, with only four transactions completed year-to-date, totaling 43,000 square feet. This trend is consistent with the previous four years as the submarket has suffered from weak transaction volume. Where it has stood out is its robust activity among large users, seeing some of San Diego's largest lease transactions, most recently Celgene who signed a 172,000-square-foot, 10-year transaction late last year.

Outlook

UTC currently has 330,000 square feet of space under construction with another 784,000 square feet of potential build-to-suit and redevelopment opportunities, with both BioMed Realty and Alexandria working on future plans. Bristol-Myers Squibb finalized its purchase of Amylin Pharmaceuticals in August and has yet to announce plans for the 406,000 square feet that Amylin currently utilizes. Additionally, Illumina continues to market its 193,000-square-foot campus for sublease. Look for UTC / Eastgate to continue modest amounts of leasing activity through the balance of 2012, with no large transaction on the horizon.

Key market indicators

Inventory		2,273,936 s.f.
Total availability		26.5%
Direct availability		9.9%
Sublease availability		16.6%
Asking rents		\$2.65-\$3.75 NNN/s.f./mo.

Change quarter-over-quarter



LEASING ACTIVITY

Samumed 12,125 s.f.

2 BTS DEVELOPMENTS

Innovation Center
275,000 s.f.
Cushman Land 190,000 s.f.

ESPLANDE

A 67,050 s.f. building redevelopment project.

SOLSTICE

The biotech firm is in the market for 5,000 s.f.

UTC currently has 330,000 square feet of space under construction with another 784,000 square feet of potential build-to-suit and redevelopment opportunities.

Activity key:

Leasing

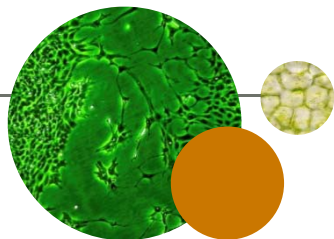
Development

Sales

Tenants in the market

Large blocks of space

Sorrento Mesa



Overview

Sorrento Mesa is comprised of 4.0 million square feet of lab space and caters to all tiers of San Diego life sciences companies. Some of the largest companies there include BP Biofuels, AstraZeneca (Ardea), Hologic (Gen-Probe), Vical, Arena Pharmaceuticals, Nuvasive and Genomatica. Over the years, Sorrento Mesa was formed as developers saw opportunities for greater returns through the conversion of industrial and flex buildings into R&D wet lab facilities.

Sorrento Mesa recorded 253,000 square feet of leasing activity during the first half of 2012, more than any other submarket; this was highlighted when Shire Pharmaceuticals selected the vacant land site on Camino Santa Fe (adjacent to the existing Alere campus) for its regenerative medicine campus. Shire's initial plan is to construct a 170,000-square-foot facility to house manufacturing, warehouse, and other uses, with the site able to provide growth of up to 800,000 square feet.

Outlook

Sorrento Mesa boasts a number of emerging companies that continue to expand within the submarket. Organovo, a breakthrough regenerative medicine company, has continued to grow over the past five years and recently moved into a 15,000-square-foot, state-of-the-art facility on Nancy Ridge Drive. Genomatica, voted number one in *Biofuels Digest* "30 Hottest Companies," continues to gain momentum and market share. The company recently raised a \$41.5 million, Series D round of financing and is in negotiations to expand its 29,000 square foot premises within the Wateridge Summit campus. Since inception, the company has secured a total of \$125.0 million in financing.

Key market indicators

Inventory		4,009,844 s.f.
Total availability		8.6%
Direct availability		5.8%
Sublease availability		2.8%
Asking rents		\$2.25-\$2.85 NNN/s.f./mo.

Change quarter-over-quarter



LEASING ACTIVITY
Shire Pharmaceuticals
 170,600 s.f. (build-to-suit)
ACON Labs 16,784 s.f.
SG Biofuels 11,417 s.f.

PACIFIC CORPORATE CENTER
 A 83,000 s.f. build-to-suit.

WESTRIDGE
 A 45,000 s.f., two building flex / lab campus on Nancy Ridge Drive sold for \$4.4 million (\$96 p.s.f.).

4 BIOTECH REQUIREMENTS
 Intrexon is out for 35,000 s.f., Tear Lab has a 14,000 s.f. requirement, Valor Medical is out for 10,000 s.f. and SKS Ocular 4,000 s.f.

Shire's plan is to construct a 170,000-square-foot facility to house manufacturing, warehouse and other related uses, with the site providing planned growth of up to 800,000 square feet.

Activity key:

Leasing

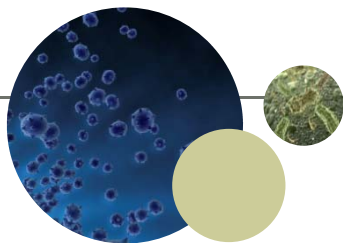
Development

Sales

Tenants in the market

Large blocks of space

Sorrento Valley



Overview

Sorrento Valley was developed as an ancillary market to Torrey Pines and today continues to be home to many of San Diego's start-up life sciences companies. With a base of older industrial and flex buildings that have been converted to lab space, this submarket provides an economical alternative for early stage companies. Some of the submarket's prominent companies include Halozyme Therapeutics, Tandem Diabetes and Althea Technologies.

First half leasing activity within the Sorrento Valley submarket produced four lease transactions totaling 77,000 square feet of total leasing activity, with no deals completed during the second quarter. Despite the limited activity, however, the submarket has recorded a steady increase in rental rates, trending toward the mid-\$2.00 per square foot per month NNN range. Although some of this increase is due to the overall health of the life sciences market, the repositioning of antiquated space is also strengthening rents.

Outlook

BioMed Realty, which led the submarket's redevelopment trend at its newly renovated Coast9 campus, has seen considerable leasing activity. The newly renovated campus has already signed four new companies totaling 38,000 square feet, with another two companies currently in negotiations. Further repositioning of Sorrento Valley's older product is anticipated by Parallel Capital Partners who recently purchased 310,000 square feet of lab, office and R&D buildings from Collins Development. Leasing activity among smaller tenants is expected to remain strong during the second half of 2012, which will further reduce lab space availability under 10,000 square feet.

Key market indicators

Inventory		1,260,661 s.f.
Total availability		26.1%
Direct availability		20.5%
Sublease availability		5.6%
Asking rents		\$1.95-\$2.50 NNN/s.f./mo.

Change quarter-over-quarter



LEASING ACTIVITY
Althea Technologies
 2,633 s.f. (100 percent office)

2 REDEVELOPMENT PROJECTS
Coast9 163,000 s.f.
4215 Sorrento Valley Boulevard 55,000 s.f.

COLLINS PORTFOLIO
 Collins Development, a long time owner of lab, flex and office space in Sorrento Valley, is under contract to sell its 310,000 s.f. portfolio to Parallel Capital Partners. The purchase price is estimated at \$130 p.s.f.

4 BIOTECH REQUIREMENTS
 Inovio Pharmaceuticals has a 20,000 s.f. requirement, Pathway Genomics 12,000 s.f., NexBio is out for 15,000 s.f. and Cosmo Biosciences 5,000 s.f.

Sorrento Valley has recorded a steady increase in rental rates, trending toward the mid-\$2.00 per square foot per month NNN range.

Activity key:

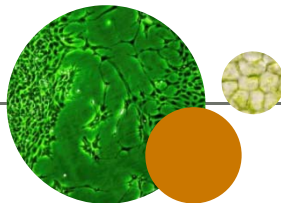
Leasing

Development

Sales

Tenants in the market

Large blocks of space



The Bay Area ranks No. 3 among U.S. life sciences clusters, bolstered by its proximity to institutions of higher education and venture capital funding, as well as its talented workforce.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

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Within the United States, life sciences-focused clusters are at various stages in their evolution. The Northeast and California continue to dominate with their extensive university networks and deep labor pools, but, more and more, emerging clusters offer great talent coupled with more competitive real estate opportunities.

San Francisco Bay Area market overview

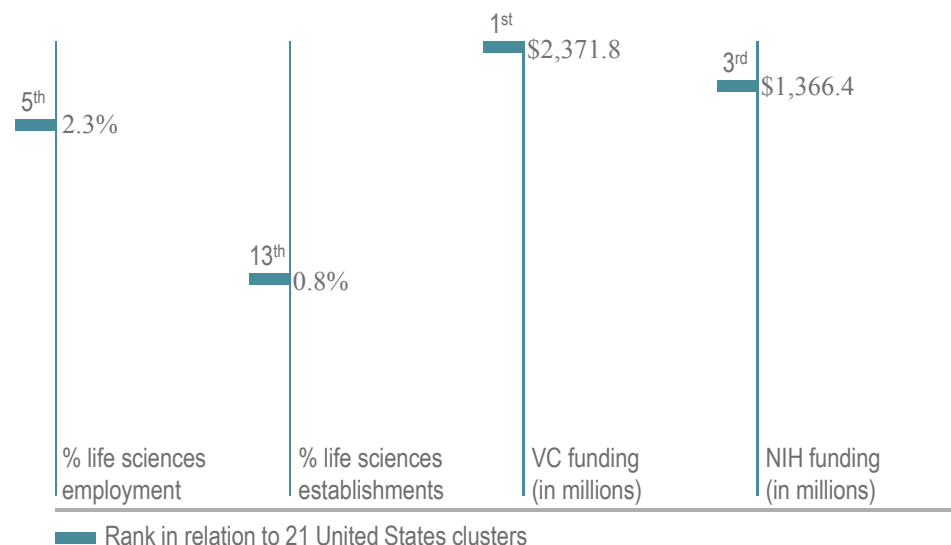
Long considered one of the greatest cities in the world, San Francisco boasts a location, business center and tourist destination unmatched by many. These qualities continually attract students to

its local universities as well as job seekers desiring the San Francisco lifestyle. As a result, the city's talent pool consists of some of the brightest and most innovative in their field.

Down the coast, Mid-Peninsula and Silicon Valley have long been at the forefront of innovation and advancement in technology, attracting talent from all around the world. Major corporations such as Genentech continually support academic programs at local universities through grants, scholarships and internship programs. Specific areas within Palo Alto are dedicated solely to research and development firms and heavily recruit recent graduates from nearby Stanford to adopt next generation innovation.

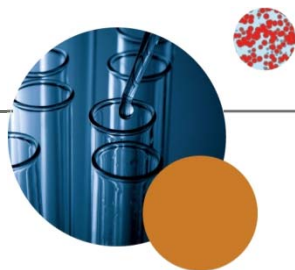
The East Bay shares this talent pool, and UC Berkeley attracts students from around the world to its renowned biology and chemistry programs. For more than 30 years the University of California at San Francisco, Stanford University and the University of California at Berkeley have actively partnered with experts in the industries of healthcare, biotechnology and pharmaceuticals to develop some of the most cutting-edge advances in the field of medicine.

San Francisco Bay Area life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

Mid-Peninsula



Overview

The San Francisco Mid-Peninsula is home to a multitude of top life sciences, biotechnology and pharmaceutical firms in the United States. Its central location between Silicon Valley, San Francisco and the East Bay gives companies greater access to talent and innovation throughout the greater Bay Area. The majority of life sciences companies have collected near and around the South San Francisco submarket where Genentech has established a significant presence. Other well-known firms in the area include Novartis, Life Technologies, Stemcentrx, Genomic Health, Exelixis, Rigel Pharmaceuticals, Amgen, Onyx Pharmaceuticals, Elan, Janssen Pharmaceuticals, Crecendo Bioscience, Sutro Bio Pharma, Theravance, Pain Therapeutics, Heartflow Cardio, Threshold Pharmaceuticals, Gilead Science and Facet Bio.

Outlook

Recent acquisitions by larger companies coupled with other external pressures in the global life sciences industry have begun to impact local real estate decisions in the Mid-Peninsula. Recent acquisitions of smaller biopharmaceutical companies have resulted in the consolidation and reduction of space. Although this has created a sense of uneasiness among landlords and life science developers, it has provided more opportunities for newer-generation biotech companies by freeing up space with existing R&D and lab improvements. South San Francisco has seen a majority of the industry's leasing activity given its location, access to local talent and its strong foundation as being a major biotech and life science hub for the Bay Area.

With most deals signing within the 10,000- to 25,000-square-foot range, leasing activity has been moderate when compared to its heated office counterpart. For this reason, although there are many plans for new construction, life science developers are currently in a holding pattern and will not break ground unless their project has genuine interest from a major tenant.



STEMCENTRX

expanded into an additional 22,191 s.f. of space at 450 East Jamie Court in South San Francisco, expanding its current footprint in the building to 46,581 s.f.

259 E GRAND AVENUE

Onyx Pharmaceuticals will start construction on its 170,618 s.f. building at 259 E Grand Avenue in South San Francisco.

120-150 INDUSTRIAL ROAD, SAN CARLOS

Vice Capital LLC acquired the 229,640 s.f. R&D building from Nguyen Family Trust for \$46.2M, or \$201 p.s.f. The property is currently occupied by Novartis.

AFFYMAX

The drug discovery and development company is currently in the market for 125,000 to 150,000 s.f. of space with lab infrastructure.

The Mid-Peninsula has long been a hub for the nation's top life sciences and biotechnology firms.

Activity key:

Leasing

Development

Sales

Tenants in the market

Large blocks of space

Mission Bay

Overview

During the last decade, San Francisco's Mission Bay submarket has undergone a significant transformation as one of the city's highest priority redevelopment areas. With the University of California at San Francisco anchoring the area with a world-renowned research facility and planned hospital, the area quickly generated demand among biotech and pharmaceutical companies. Today the submarket contains 4.4 million square feet of office, life science and biotechnology space and houses such firms such as Nektar Therapeutics, Bayer Pharmaceuticals and Fibrogen. Alexandria Real Estate Equities became a major developer in the area in recent years and has been one of the few companies to deliver new construction to the San Francisco market since the recession essentially froze all other construction activity in the market.

Outlook

Leasing activity among biotech and life sciences companies in Mission Bay has slowed in recent years. In 2010, Alexandria Real Estate Equities sold eight of its nine development parcels to Salesforce.com for its new headquarters. By early 2012, however, Salesforce.com abandoned development plans in favor of a more central location, re-opening the opportunity for biotech and life sciences companies to plant new roots in this burgeoning area. Although Salesforce.com's intentions for the use of this land remain unknown, several organizations in the area are excited for what may develop in the future.

SANOFI

This company signed a new lease at 185 Berry Street for 2,145 s.f. after securing a partnership with UCSF for diabetes research.

499 ILLINOIS

Alexandria Real Estate Equities purchased the 453,256 s.f. building for \$646 p.s.f. in April 2011.

1600 OWENS

Construction is pending on this 246,000 s.f. life sciences building, being developed by Alexandria Real Estate Equities.

MEDIVATION

is in the market for 28,000 s.f. of expansion space.

Mission Bay, although small compared to many rival life sciences markets, is anchored by UC San Francisco's renowned research department and unrivaled local amenities.

Oakland-East Bay

Overview

Life sciences hubs in the East Bay include Oakland, Emeryville, Berkeley, Richmond, Fremont and Newark, anchored by research institutions including the University of California, Berkeley, the Children's Hospital Oakland Research Institute, Lawrence Berkeley National Laboratory and California State University East Bay. Major companies include Amgen, Novartis, Bayer HealthCare and WaferGen Biosystems. Many companies are involved in research and development activities as well as the manufacture of their products.

The creation of the Oakland Enterprise Zone by the California State Legislature in 1993 was intended to stimulate business growth in the East Bay. Businesses located within the zone, which includes Berkeley and Emeryville, are entitled to a variety of tax incentives to promote hiring. Bayer is one of the largest biotech firms located within this zone, and was a major force in expanding the zone in 2009, a move that ensured the retention of thousands of biotech jobs in the region.

Outlook

With some of the lowest real estate costs in the Bay Area, the East Bay is an affordable location for companies looking to innovate and set up small-scale manufacturing facilities. Proximity to notable institutions in San Francisco and the South Bay, as well as a highly educated workforce, cements the East Bay as a life sciences growth market.

NOVABAY PHARM-ACEUTICALS

The firm renewed 14,544 s.f. for an 8-year term at 5980 Horton Street in Emeryville.

WATERFRONT AT HARBOR BAY

Six-building, 380,000 s.f. portfolio acquired by AmStar in July for \$46M, or \$121 p.s.f.

EVERYVILLE

Wareham Development completed EmeryStation Greenway totaling 99,000 s.f.

LAWRENCE LIVERMORE LAB

is in the market for 20 to 40,000 s.f. of dry lab/office space, and 105,000 s.f. of R&D/classroom space.

The East Bay's central location between the South Bay and San Francisco neatly rounds out the entire Bay Area as a strong life sciences cluster.

Activity key:

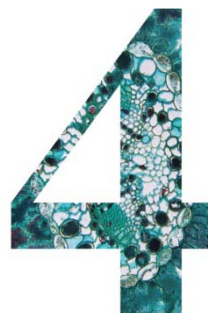
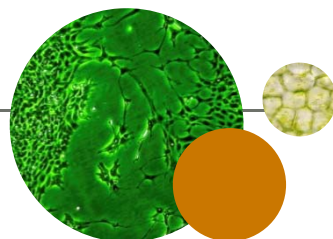
Leasing

Development

Sales

Tenants in the market

Large blocks of space



Home to one of the largest research parks, the Raleigh-Durham market has deep and mature innovation capabilities.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Within the United States, life sciences-focused clusters are at various stages in their evolution. The Northeast and California continue to dominate with their extensive university networks and deep labor pools, but, more and more, emerging clusters offer great talent coupled with more competitive real estate opportunities.

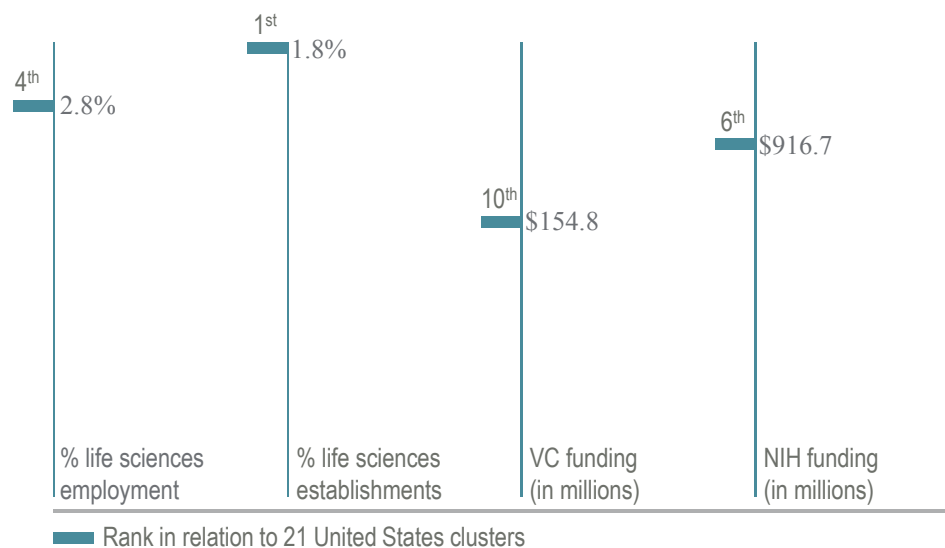
Raleigh-Durham market overview

The Raleigh-Durham life sciences cluster is familiarly called the Research Triangle Region due to the geographic nexus of the area's three leading research institutions: Duke University, North Carolina State University and the University of North Carolina at Chapel Hill. Squarely in the center

of the region is the Research Triangle Park (RTP), a 7,000-acre center of research created by the state to help coalesce R&D talent to the region.

Small start-ups and incubator groups tend to make up the majority of life sciences occupiers in the Raleigh-Durham cluster. Many are spin-offs out of the university system that migrate into RTP with hopes of gaining funding support to continue their research work. As a result, most requirements and availabilities tend to be smaller in nature, rather than large needle movers. Currently, very few lab spaces are available for lease, particularly in the range where most users fall, 5,000 to 15,000 square feet. Similarly, only two large R&D facilities remain on the market, consisting of Gilead Science's 100,000-square-foot availability and Wyeth's 81,000-square-foot facility that was vacated in 2010. There is little demand for a contiguous space of that size.

Raleigh-Durham life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

Research Triangle Region

Overview

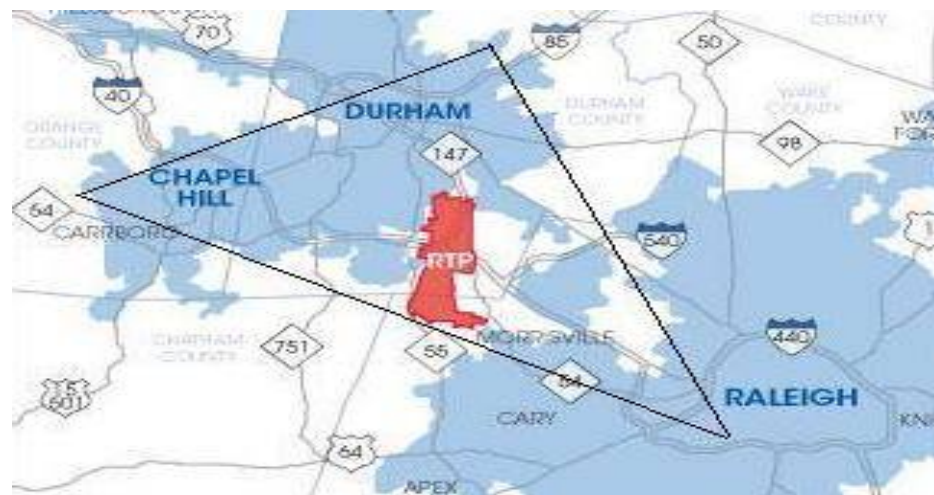
At the heart of the Raleigh-Durham life sciences market is the Research Triangle Region. This hotbed of life science companies acts as an anchor for the industry, taking advantage of the R&D talent in the region as well as the nation's largest concentration of contract research organizations. Large private institutions, like the North Carolina Biotechnology Center, provide links among academic, business and civic leaders, and funding programs to support the commercialization of innovations. Public entities on the other hand, like North Carolina Biosciences Organization, represent the interest of more than 150 companies in state and federal legislation and regulatory affairs.

Some of the industry's largest players are situated in the Research Triangle Region and have fueled much of the activity in the marketplace. Much of the current large-scale growth is fueled by ag-tech companies such as Syngenta, BASF, Monsanto and Bayer CropScience. Syngenta is adding to its current footprint by developing a 147,000-square-foot, \$71.0 million R&D facility within RTP and over the summer Bayer CropScience celebrated the opening of its newest \$20.0 million research facility, a three-story, 60,000-square-foot greenhouse. Alexandria Real Estate received approval to build its \$13.5 million, 50,000-square-foot ag-tech center in Durham. The campus will feature 18,000 square feet of greenhouse space and is expected to serve as a catalyst for the growing crop science sector.

Among pharmaceutical players, United Therapeutics is close to completing a 180,000-square-foot addition to its approximately 200,000-square-foot facility. Construction began in May of 2011 and the total cost has been estimated at \$74.0 million. Additionally Salix Pharmaceuticals, who completed a 120,000-square-foot office headquarter merger in early 2011, is still exhibiting modest expansion potential.

Outlook

Overall, the Research Triangle Region is expected to remain fairly stable during the coming quarters with fluctuations of expansions and contractions among the area's many tenants. Major swings in vacancy, in either direction, are not expected and the market should continue to have a stable presence of life sciences players in the year to come.



METABALON, INC.
leased 27,105 s.f. at 617 Davis Drive in the Keystone Technology Park.

UNC HEALTHCARE
Leased 15,000 s.f. at Quadrangle I.

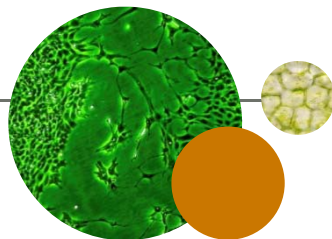
MERCK
purchased the 113,000 s.f., 25-acre Diosynth Plant at 6501 George Watts Drive. The property will serve as a cGMP production facility.

UNITED THERAPEUTICS
is underway on a 180,000 s.f. expansion.

SYNGENTA
The ag-tech company is developing a 147,000 s.f. R&D facility.

BASF
is in the market with a 40,000 s.f. requirement

Squarely in the center of the region is the Research Triangle Park (RTP), a 7,000-acre center of research created by the state to help coalesce R&D talent to the region.



Philadelphia's continually evolving "Eds and Meds" infrastructure is facilitating growth of its deep life sciences employment and corporation base.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the innovation formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Within the United States, life sciences-focused clusters are at various stages in their evolution. The Northeast and California continue to dominate with their extensive university networks and deep labor pools, but, more and more, emerging clusters offer great talent coupled with more competitive real estate opportunities.

Philadelphia market overview

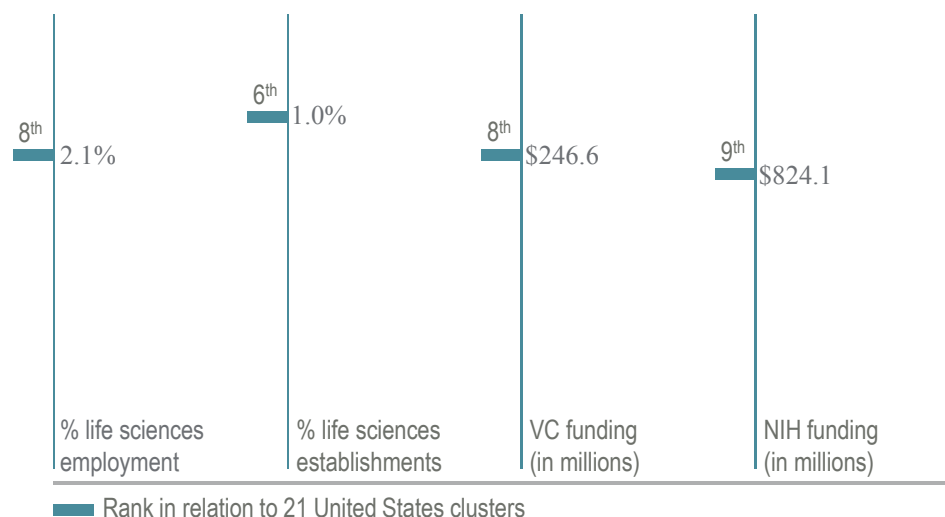
Philadelphia's large concentration of leading academic institutions and pharmaceutical companies has created a central life sciences hub in the Mid-Atlantic region. With close proximity to New York's financial markets and Washington, DC's regulatory center, the Philadelphia Metropolitan Area is home to more than 1,200 companies, ranging from the industry's largest multinational

companies, including AmerisourceBergen, GlaxoSmithKline and Shire Pharmaceuticals, to the sector's fastest growing firms, such as NuPathe, Tengion and PhaseBio.

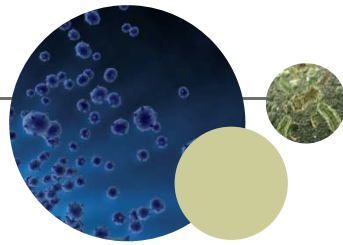
The region's vast array of leading universities and research institutes fosters a collaborative environment, having drawn nearly \$4.0 billion of venture capital funding to the region over the past 10 years. This constituted 61.6 percent of all venture capital funding in that period. As a result, Philadelphia's innovation hubs, such as Ben Franklin Technology Partners, have harbored the development of leading biotechnology companies from the start up to growth stages. Two of the countries' largest biotechnology IPOs in 2010, NuPathe and Tengion, were founded and grown using these resources. Most recently, Audubon-based Globus Medical raised \$100.0 million in its August IPO this year, marking the first successful public debut for the region's life sciences industry since 2010.

The enhancement of the cluster's existing sector infrastructure has been strengthened through the investments of the area's leading research institutions and world-renowned teaching hospitals. With 100 colleges and universities and 25 medical schools, Philadelphia's institutions have fed the region's 432,000 jobs and \$20.2 billion in earnings within the biotechnology and healthcare sectors, accounting for nearly 15.0 percent of Philadelphia's economic activity. These factors collectively have created a bioscience innovation hub with a deep talent pool and the resources to facilitate continued growth.

Philadelphia life sciences scorecard



University City



Overview

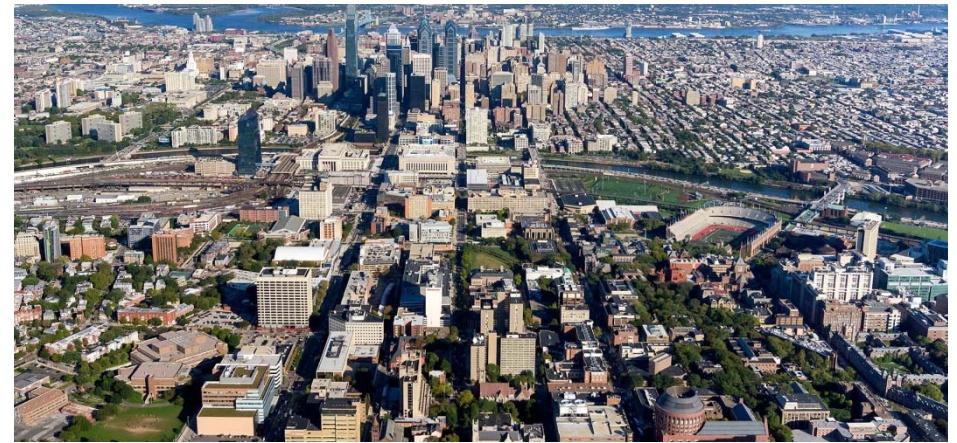
Located due west of the Schuylkill River in the Philadelphia Central Business District, University City plays host to the University City Science Center, one of the oldest and largest urban research parks in the United States. The Science Center is strategically located proximate to several major universities and research institutions including the Children's Hospital of Philadelphia, Drexel University, the University of Pennsylvania, University of the Sciences in Philadelphia and the Wistar Institute. Serving as an incubator for many of the region's growing companies and research efforts, University City's Science Center has led to more than 40,000 jobs in the region and \$64.5 million for the city and state in tax revenue.

As a result of high demand for space in the Science Center's incubators and the proven success of its graduate companies, the Science Center's state-of-the-art laboratory facilities have transformed the growing submarket into the tightest, most expensive submarket in the CBD. In August 2012, the University of Pennsylvania announced a global research and licensing agreement with pharmaceutical corporation Novartis. As part of the deal, Novartis is committing \$20.0 million to build the Center for Advanced Cellular Therapies, which will house the cancer research studies. The facility will be in close proximity to Penn's campus.

In light of record-low vacancy and more than 2.0 million square feet of proposed developments in University City, developers continue to market properties to anchor tenants. Most recently, spurred by a lease with Penn Presbyterian Medical Center, the Science Center broke ground on 3737 Market Street as part of a joint venture with Wexford Equities. The 272,700-square-foot asset will contain 88,000 square feet of new office and lab space for the market's start-up tenants. Although most of the region's development activity has consisted of build-to-suit projects for pharmaceutical tenants, University City contains both of the market's only ground-up office projects with vacancy. With prospects for continued development, University City owners will continue to target life sciences and "Eds & Meds" tenants for remaining development sites.

Outlook

Growing life sciences tenants and developing research initiatives are broadening the pharmaceutical tenant base in the tight submarket. Whereas University City's incubator-born, VC-bred firms such as Avid Radiopharmaceuticals, Centocor, Morphotek and BioRexis have brought leading pharmaceutical companies to the Philadelphia CBD via acquisitions, Penn's recent partnership with Novartis is reflective of institution-led innovation via translational research. With the University of Pennsylvania and the Children's Hospital of Philadelphia both experiencing continued growth and expanding research capabilities, the region's leading research institutions will continue to drive real estate activity and investor interest in the market's leading research hub.



View from University City to Center City Philadelphia

PENN PRESBYTERIAN MEDICAL CENTER

signed a 155,700 s.f. lease at the Science Center's new ground up development at 3737 Market Street. The lease, paired with a 25,950 s.f. lease with Good Shepherd Penn Partners, drove the project's September groundbreaking.

AVID RADIO-PHARMACEUTICALS

expanded from 16,000 to 24,500 s.f. The Lilly subsidiary has continued to expand since graduating from one of the Science Center incubators.

3737 MARKET STREET

Spurred by a large lease with Penn Presbyterian Medical Center, the 272,700 s.f. property broke ground in September 2012. The \$80.0 million project will bring 88,000 s.f. of new lab and office space to University City.

WISTAR INSTITUTE

Scheduled for Spring 2014 completion, the Wistar Institute is under construction on its new \$100.0 million, 89,700 s.f. Cancer Research Tower. The expansion will enable Wistar to expand its research operations, scientific faculty and collaborative research.

The epicenter of Philadelphia's higher education and healthcare sectors, University City, serves as the regional hub for research, talent and innovation.

Activity key:

Leasing

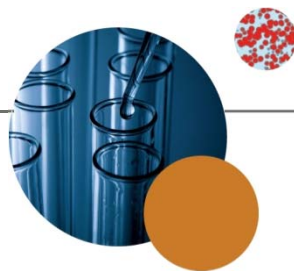
Development

Sales

Tenants in the market

Large blocks of space

Route 202 Corridor



Overview

While lab presence is spread throughout the Pennsylvania suburban markets, the largest concentration resides along the Route 202 Corridor that extends from King of Prussia / Wayne to the Malvern / Exton submarket. The area is home to several of the region's largest pharmaceutical firms, including AmerisourceBergen, Auxilium Pharmaceuticals, Endo Health Solutions, Shire Pharmaceuticals and West Pharmaceuticals as well as many life science companies which have opted to co-locate for synergistic and logistical purposes.

The Route 202 Corridor has become a hotbed of construction activity between new office construction and major roadway infrastructure repairs and improvements. At the end of 2011, two major life science tenants, Endo Health Solutions and West Pharmaceuticals, announced build-to-suit headquarters projects in Malvern and Exton respectively. Both projects are expected to be completed by the start of 2013, delivering 471,000 square feet of LEED-certified office / lab space along the 202 Corridor, marking the first new office completion in Malvern / Exton since 2008. Looking past the obvious economic impact, these deals reveal the growing trend of large pharmaceutical companies announcing plans to build LEED-certified headquarters projects.

Starting in 2011, the Pennsylvania Turnpike Commission began two major infrastructure improvements to strengthen the corridor's accessibility, making it more desirable for life science companies. In March of 2011, the Turnpike Commission began building the Route 29 All-Electronic Interchange ("AEI"), or slip ramp, along the Pennsylvania Turnpike in an effort to shorten travel times of the more than 50,000 commuters who use Route 202, Route 29 and the Turnpike daily. Simultaneously, the Turnpike Commission started a road widening project to expand a highly traveled 6.5-mile stretch of the Route 202 highway between Swedesford Road and the Exton Bypass, which is expected to be completed by summer 2014.

Outlook

The advent of these infrastructure improvements were instrumental in Endo Health Solutions' decision to move forward with its new build-to-suit headquarters project off the Turnpike Interchange exit in Malvern. The infrastructure improvements are garnering the interest of most large tenants in the market, greater than 100,000 square feet, with several build-to-suit opportunities in close proximity to Endo's new facility at growing corporate parks such as Atwater Corporate Campus and Great Valley Corporate Center. The Corridor's largest current requirement, Shire Pharmaceuticals, is searching for 300,000 to 500,000 square feet of specialized office / lab space. Rather than renewing or relocating to second generation lab space, the company has narrowed its search to sites near the Interchange. With more than 900,000 square feet of large tenants in the market, expect more big deal activity and construction announcements along the Route 202 Corridor through 2013.



A recent view of the Route 202 widening project from the Route 29 overpass in Malvern

AUXILIUM PHARMACEUTICALS

signed a new lease to relocate from Malvern into 74,516 s.f. at 640 Lee Boulevard in Wayne.

BUILD-TO-SUIT HEADQUARTERS TO DELIVER EARLY 2013

Endo Health Solutions' 300,000 s.f. facility at the Atwater Corporate Center in Malvern, and West Pharmaceuticals' 171,000 s.f. property in Exton are completing construction.

BPG PROPERTIES

acquired a two-property portfolio totaling 170,866 s.f. of lab and office space for \$19.8 million, or \$116 p.s.f. The properties were located in West Chester and Exton and were 100% leased.

SHIRE PHARMACEUTICALS

Looking to build a 300,000 to 500,000 s.f. headquarters facility along the Route 202 Corridor.

The Route 202 Corridor is home to the largest life sciences companies in the Philadelphia Suburbs. Tenants located in the market include Auxilium, Endo, Shire and West Pharmaceuticals.

Activity key:

Leasing

Development

Sales

Tenants in the market

Large blocks of space



Life Sciences activity in the Suburban Maryland / DC / Arlington cluster largely occurs in suburban Montgomery County.



Global trends

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Suburban MD / DC / Arlington market overview

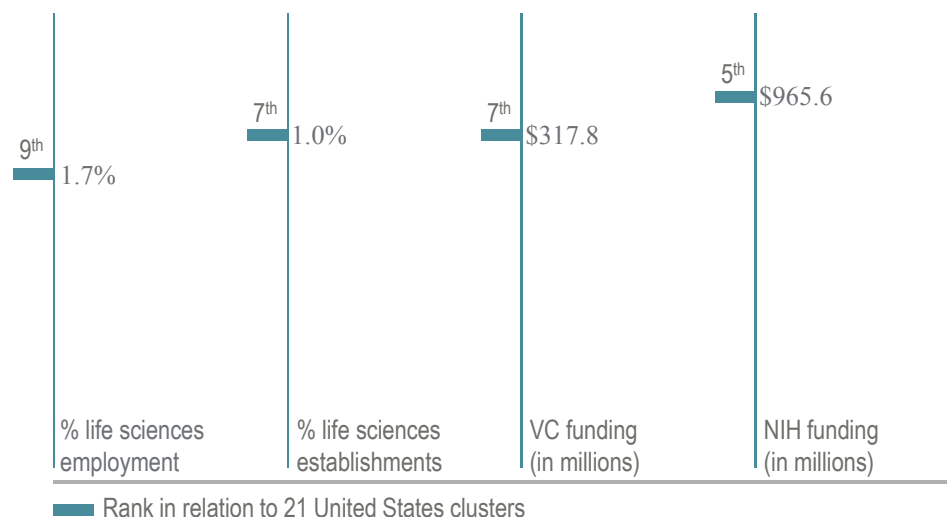
The Suburban Maryland / DC / Arlington life sciences cluster has benefited tremendously from the area's large federal government presence. Government agencies such as the National Institutes of

Health (NIH) and the U.S. Food and Drug Administration (FDA) have provided contracts for private sector companies as well as a critical mass of scientists who have gone on to start or staff many of the region's private biolife companies.

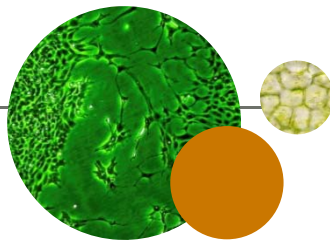
Aside from its federal backbone, the market boasts a significant inventory of existing lab space which originated primarily from a decision by Alexandria Real Estate to invest in speculative space. The growth that rewarded Alexandria came largely from research into the human genome. The companies that led the region's development into a cluster included Human Genome Sciences, MedImmune and Qiagen, all with strong ties to the federal government and an affinity for public-private research partnerships.

The life sciences are largely clustered among suburban Montgomery County, particularly along the I-270 corridor. The J. Craig Venter Institute and Johns Hopkins (satellite campus) are both located there. Federal government facilities are found to the south in the Twinbrook, White Flint and North Bethesda submarkets. Washington DC and Arlington, VA act as supporting clusters to life sciences activity in Maryland. Their proximate locations keep talent and funding flowing across the region.

Suburban MD / DC / Arlington life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health



I-270 Corridor

Overview

The life sciences are largely clustered among suburban Montgomery County, particularly along the I-270 corridor, known locally as “DNA alley.” Within the I-270 corridor, a heavy concentration of biolife companies is found in the Shady Grove micromarket encompassing Rockville and Gaithersburg.

The disposal of large blocks of space and federal budget cuts earlier this year swelled vacancy in the area and diminished rental rates from the peak achieved in 2010. A prime example is J. Craig Venter Institute’s current sublease of its entire building at 9704 Medical Center Drive (124,000 square feet). Conversely, the NIH signed a 15-year lease for 75,056 square feet at 9800 Medical Center Drive in Rockville for its infectious disease research lab. It is one of the largest leases for the industry in 2012. Novavax signed a large deal in 2011 and is slated to move into 20 and 21 Firstfield Road in Gaithersburg. The company will be vacating approximately 25,600 square feet at the end of 2012 and the other half of the building in the middle of 2013. Now that the company has a future home it is trying to sublease its current space at 9920 Belward Campus Drive.

Qiagen plans to build a 244,000-square-foot facility and will initially only occupy half the space, allowing the balance to be ready for anticipated future company expansion. Emergent BioSolutions reportedly moved into an additional 8,000 square feet to total more than 40,000 square feet at 2273 Research Boulevard. The company sells the only approved anthrax vaccine to the federal government and recently won a grant worth up to \$200.0 million dollars to launch a new biodefense development and manufacturing facility in the state of Maryland. Intrexon decided to stay and renew at 20358 Seneca Meadows Parkway in Germantown. Based in Blacksburg, Virginia, Intrexon signed a 55,000-square-foot lease of both laboratory and office space. The company designs and produces novel and enhanced biological products and processes throughout multiple industry segments.

Human Genome Sciences (HGS) was acquired by GlaxoSmithKline (GSK) in 2012 for \$14.25 per share. GSK revealed that the transaction will improve their earnings beginning in 2013 and will result in a \$200.0 million cost saving by 2015. These companies have reportedly worked together for years, including a lupus treatment which was granted marketing approval last year. HGS occupies 9910 and 9911 Belward Campus Drive and 14200 Shady Grove Road. GSK placed 14200 Shady Grove Road on the market for sublease in 2012. The three building complex totals 657,414 square feet and is located close to the I-270 corridor.

In the area of new development, the National Cancer Institute (NCI) has a build-to-suit under construction. The building will be approximately 575,000 square feet and is slated to deliver in 2012 /

2013. Great Seneca Science Corridor is under construction with multifamily projects; however, the existing and proposed development plans include 17.5 million square feet of commercial space, 9,000 dwelling units and 52,500 jobs.

Outlook

Given historically modest growth in election years, a decrease in the federal budget and an apprehensive posture toward new investment among most businesses across the country, tenant demand in the I-270 Corridor’s life sciences sector has stagnated. State and local government incentives, venture capital investments in the life sciences space and technological innovations, however, could produce significant long-term gains for the industry in the years ahead but does not have enough influence to be an immediate effect. In light of these conditions, real estate participants would be well advised to continue monitoring the life sciences industry to ensure that supply / demand trends are optimized in their favor.

NIH

The institute signed a 15-year lease for 75,056 s.f. at 9800 Medical Center Drive.

GREAT SENECA SCIENCE CORRIDOR

is under construction with multifamily projects; however, the existing and proposed development plans for 17.5M s.f. of commercial space.

BIOMED REALTY TRUST

purchased Belwood I and II in 2012 for a reported \$26.2 million (\$245.80 p.s.f.). The two properties totaled 106,469 s.f.

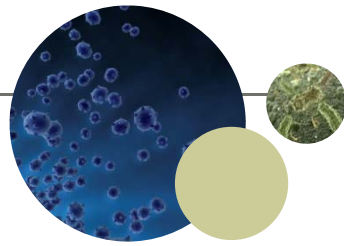
J. CRAIG VENTER

The institute is subleasing their entire building at 9704 Medical Center Drive, consisting of 124,000 s.f.

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I-270 Corridor lease activity





Frederick

Overview

Many price-conscious tenants are drawn to the Frederick market due to its proximity to I-270 and the Shady Grove micromarket. In general, as space in the Rockville-Gaithersburg area, including Shady Grove, is absorbed this could cause tenants to venture farther north on I-270 into Frederick. A handful of tenants have decided to be in both the I-270 Corridor and Frederick markets. MedImmune has their headquarters in Gaithersburg but also has a branch in Frederick and Qiagen and Charles River Laboratories have also made Frederick their home. Qiagen moved in an additional 10,000 square feet in early 2011 to occupy the entire building at 6951 Executive Way. Charles River Laboratories is staying in Frederick, renewing their lease of 35,003 square feet early in 2012.

Outlook

Strong ties to the Shady Grove micromarket should bode well for the emerging market. After experiencing a slight increase in vacancy in 2011, it has tempered off in 2012 and will likely remain stagnant over the coming quarters.

CHARLES RIVER LABORATORIES

renewed 35,003 s.f. for five years at 15 Wormans Mill Court.

EMERGENT BIOSOLUTIONS

sold Wedgewood IV, buildings 1 and 3 (292,000 s.f.) to Matan Realty for \$12.2M, both 100 percent vacant.

U.S. ARMY MEDICAL RESEARCH INSTITUTE OF INFECTIOUS DISEASE

is under construction on a six-story research facility at Fort Detrick, due to deliver in 2014.

MRIGLOBAL

has a reported lease expiration in 2013. R&D is presumed to be the function at its current Frederick location.

Charles River Laboratories is staying in Frederick, renewing their lease of 35,003 square feet.

Activity key:

Leasing

Development

Sales

Tenants in the market

Large blocks of space



New Jersey / New York City ranks No. 7 among U.S. life sciences clusters, supported by a large labor force and life sciences-business community.

Global trends

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New Jersey / New York City market overview

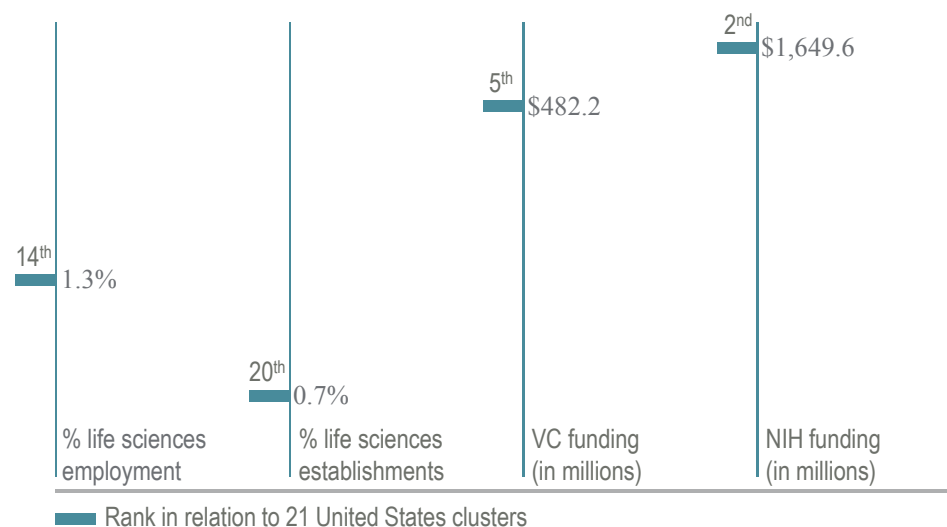
The New Jersey / New York City area remains one of the most desirable locations for life sciences firms in the country with the highest concentration of college graduates in the nation. The cluster directly employs over 106,000 people in the life sciences industry, the second highest amount in

the nation behind only Los Angeles, and boasts over 3,700 life sciences establishments, the most in the United States. Although these raw statistics are impressive and demonstrate the deep resource pool available, they lose their impact when viewed as a percentage of total employment and establishments, given the large concentration of workforce and businesses in the New Jersey / New York City metro area.

The New Jersey / New York City life sciences market consists of the five boroughs of New York City and Northern and Central New Jersey. Although proximity to major research universities helped build the established life sciences clusters in Boston and Raleigh-Durham, access to major transportation and distribution systems coupled with the aforementioned concentration of educated employees and academic institutions has driven the life sciences industry locally. Nearly all the world's major pharmaceutical companies have operations in the metro area, including Pfizer, Merck, Johnson & Johnson, Celgene, Bayer and Novo Nordisk.

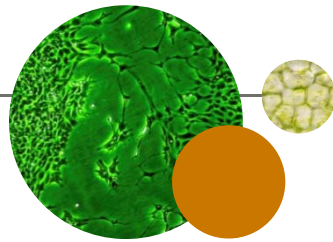
Although some of the large life sciences and pharmaceutical firms have continued to consolidate their operations through the area, demand has remained strong, especially within New Jersey as small and mid-level firms have increased in both numbers and size in the last few years.

New Jersey / New York City life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

New Jersey



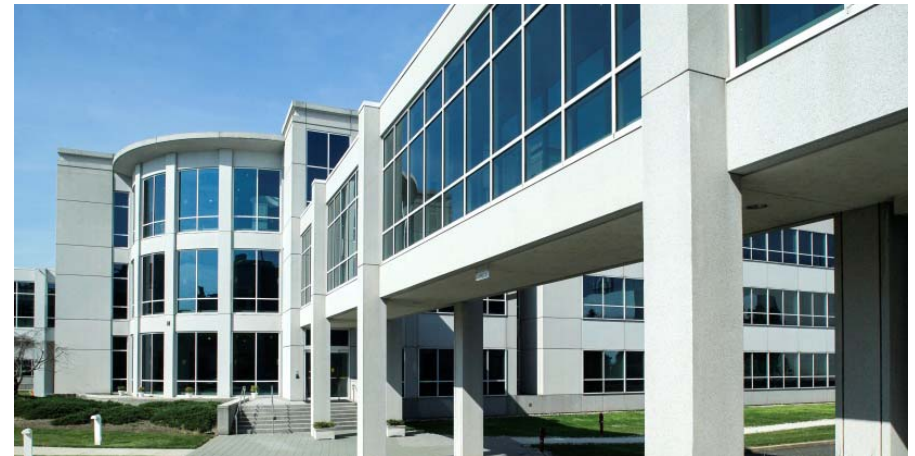
Overview

A large concentration of pharmaceutical, biotech and medical device firms is one of the primary attributes that has helped position New Jersey as a global leader in the life sciences industry. Bayer HealthCare, Bristol-Myers Squibb, Celgene, Johnson & Johnson, Novartis Pharmaceuticals, Novo Nordisk, Merck and Pfizer are among the companies with a large presence in New Jersey. Furthermore, the technical demands of many life sciences' occupations require a highly skilled workforce, which is continually replenished by a pipeline of graduates from the state's colleges and universities. Almost two-thirds of the life sciences' New Jersey workforce holds at least a bachelor's degree. Geographic proximity to Manhattan and a mature transportation infrastructure that includes access to Newark Liberty International Airport have helped Garden State companies to reach the global marketplace.

Northern and Central New Jersey are known as the "Medicine Chest" of the world. The three primary geographic markets within Northern and Central New Jersey that contain the largest concentration of life sciences industry companies are The Route 1 Corridor from Middlesex County south to the Princeton area, Somerset/Morris counties (the Golden Triangle region) and parts of Bergen County. These areas currently boast much of the state's 5.9 million square feet of available R&D/Lab space for lease.

The sluggish economic conditions combined with mergers and acquisitions among the large pharmaceutical companies continue to shuffle players in the state. After operating in Northern New Jersey for 80 years, Roche recently announced that it will be closing its Nutley research center by 2013 and will shed 1,000 jobs. The 119-acre site along Route 3 is likely to be redeveloped for retail use. The Swiss pharmaceutical company plans on opening a smaller clinical research center to be located in New York, while continuing to employ 400 people at its diagnostics facility in Branchburg. In Monmouth Junction, Pfizer sold its 378,000-square-foot research facility, which is now being marketed for multitenant use. The building was originally utilized by Wyeth Research, which was acquired by Pfizer, and deemed as surplus property. In addition, Dendreon will close its manufacturing facility in Hanover Township as part of a restructuring effort, but recently leased nearly 40,000 square feet of office space in Bridgewater for its headquarters which will relocate from Seattle, Washington.

Countering these consolidations and the shedding of excess space has been demand-generated by mid-level pharmaceutical and biotech firms. In 2011, more than 2.0 million square feet of office leases were signed by companies in the life sciences sector, with approximately one-quarter of this activity involving lease extensions. Among the firms driving this wave of activity were Celgene, Evonik Degussa, Lifecell and Novo Nordisk. However, demand downshifted during the first half of 2012, with just over 600,000 square feet leased. Allergan, Dendreon and Savient have been among the firms recently absorbing significant space in the Bridgewater area.



The New Jersey Center of Excellence in Bridgewater

ALLERGAN

relocated from California and leased 93,000 s.f. at 200 Somerset Corporate Boulevard in Bridgewater. By third quarter 2012, Bridgewater witnessed more than 200,000 s.f. of life sciences activity.

NOVO NORDISK

is vacating over 240,000 s.f. of space on College Road West in Princeton and relocating its U.S. headquarters into 770,000 s.f. at 800 Scudders Mill Road in Plainsboro.

BAYER CORPORATION

purchased 67 Whippany Road (550,000 s.f.) in Whippany for future occupancy. Bayer plans to consolidate its employees throughout the state.

TEVA & PFIZER

are both in the market for significant amounts of space within the state.

The N.J. Center of Excellence in Bridgewater encompasses 1.2M square feet of lab, office, GMP production & warehouse facilities.

Activity key:

Leasing

Development

Sales

Tenants in the market

Large blocks of space

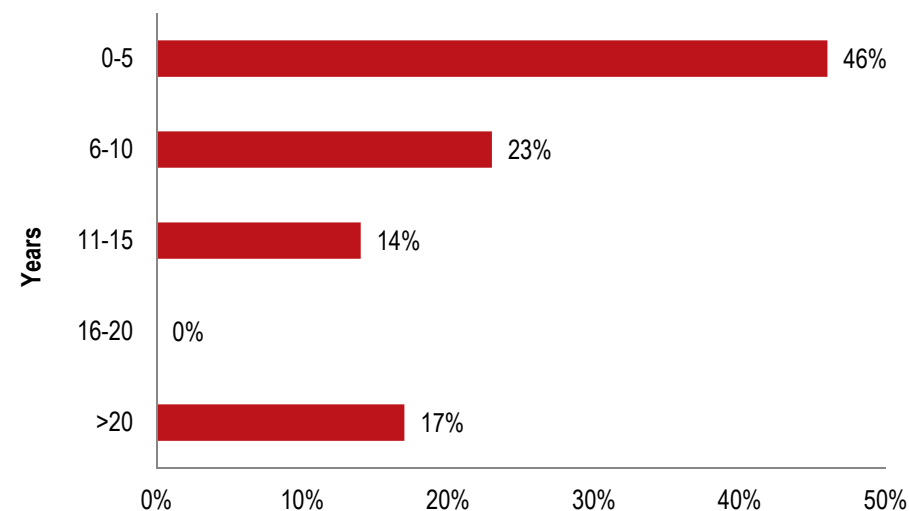
New Jersey

Outlook

Consolidations among larger pharmaceutical companies will likely continue to generate headlines in the year ahead, as firms pursue aggressive strategies to cut operating expenses. These companies are prompted to consider consolidation options due to the heightened drug development costs, now estimated over \$1.3 billion, and the considerable number of products up for patent expiration during the next few years.

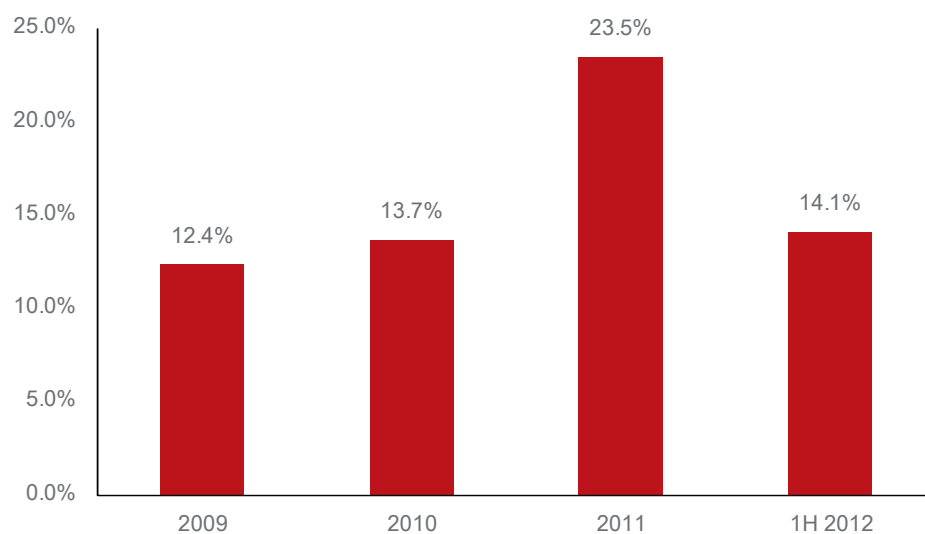
Despite the ominous shadows cast by consolidations and mergers, New Jersey's biotech industry continues to expand, according to a recently released industry survey from BioNJ and Ernst & Young. The survey reported an increase in biotech employment in the Garden State by almost 1,500 jobs since 2010. This figure does not include the thousands of indirect jobs generated by the presence of biotech firms. In addition, the number of biotech companies in New Jersey increased from 300 in 2010 to 340 in mid-2012. More than 60.0 percent of the respondents in the survey have been operating in New Jersey for either less than five years or more than 20 years. This mix of start-up and established companies are healthy ingredients for future stability and growth of the industry.

Biotech companies by number of years in business in New Jersey



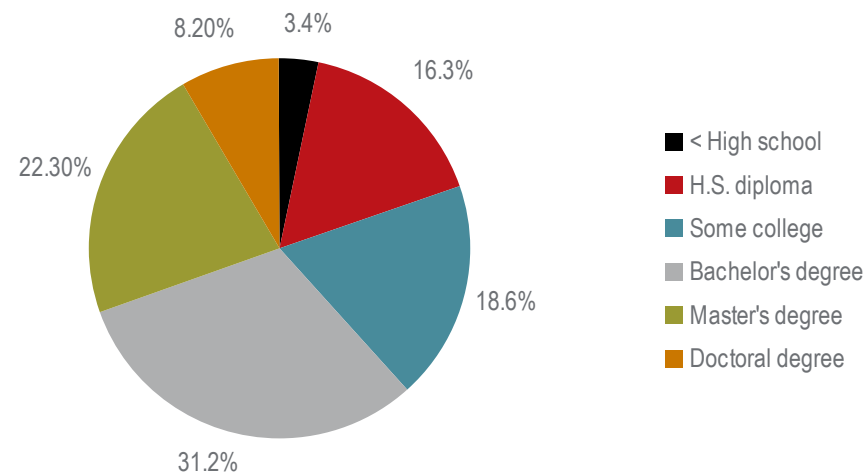
Source: BioNJ and Ernst & Young

Life sciences as % of total office leasing activity



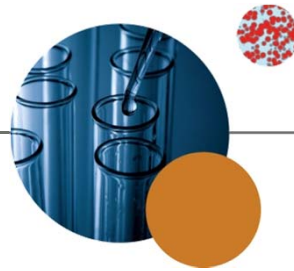
Source: Jones Lang LaSalle Research

New Jersey life sciences employee educational breakdown



Source: New Jersey Department of Labor Workforce Development

New York City



Overview

Spurred by the desire to become less reliant on Wall Street and establish New York City as an innovation hub, the New York City Economic Development Corp has embarked on a drive to grow research and education in the technology and life sciences industries. Completed in 2010, the Alexandria Center for Life Science was the first of its kind in New York City. An office park focused primarily on life sciences firms, the development has attracted big name companies such as ImClone, Abbott Laboratories and Novartis. Although historically located near hospitals or in non-central locations like the Alexandria Center for Life Science on the far east side, life sciences companies have now begun to follow the technology industry in moving to the city's fastest growing submarket, Midtown South.

Most recently, New York Genome Center signed a lease for 171,000 square feet at 101 Avenue of the Americas in Midtown South. The space will serve as the center's headquarters and will become the city's largest genetic sequencing facility, growing to about 500 employees in the first five years. Construction of the space is expected to be completed by the end of 2013 and include sequencing, bio informatics, a research lab and innovation center. The decision of the New York Genome Center to move to this location was seen as a catalyst for the life sciences industry in New York City and is expected to attract other research firms to the area. InVentiv Health, a life sciences consulting company, also signed a large lease in Midtown South for 75,000 square feet at 450 West 15th Street at the beginning of this year.

Earlier this year, Mayor Bloomberg announced a partnership between Cornell University and Technion-Israel Institute of Technology as the winner of an intense international competition to build an applied science school on Roosevelt Island. This \$2.0 billion campus is expected to house about 2,500 graduate students by 2043 and further establish New York City as a science and technology hub. The city has also provided funding this year to two other applied science schools to open campuses in the city: Columbia University in Washington Heights and New York University in Brooklyn.

Outlook

With the city's continued efforts and plans for innovation growth, we anticipate more bioscience and technology research centers will open in the city in the near future. Although asking rents are on the rise in Midtown South, we predict this will be a growing area for these industries as they strive to attract employees and be close to their peers. The development of applied science schools will further grow the employee talent base in the city and spur new company development in the coming years.



(left to right): the Alexandria Center for Life Science and the New York Genome Center

NEW YORK GENOME CENTER

signed a lease for 171,000 s.f. at 101 Avenue of the Americas. The center plans to build a state-of-the-art research center and plans to grow from 100 to 500 employees over five years.

ALEXANDRIA CENTER FOR LIFE SCIENCE

completed the first stage of construction in 2010, which included the first three buildings planned. The lower east side site plans to have 1.0M s.f. of commercial lab space on the city-owned land.

ALCON

The eye care division of Novartis is out with 20,000 s.f.

ELAN

is out with 15,000 s.f.

“Our city really is a global leader in the commercial life sciences, with some 110,000 employees this sector is already larger here than in any other metropolitan area in the U.S.”
-Mayor Bloomberg

Activity key:

Leasing

Development

Sales

Tenants in the market

Large blocks of space



The Los Angeles / Orange County market ranks No. 8 among U.S. life sciences clusters, specializing in medical research and medical device manufacturing.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

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Within the United States, life sciences-focused clusters are at various stages in their evolution. The Northeast and California continue to dominate with their extensive university networks and deep labor pools, but, more and more, emerging clusters offer great talent coupled with more competitive real estate opportunities.

Los Angeles / Orange County market overview

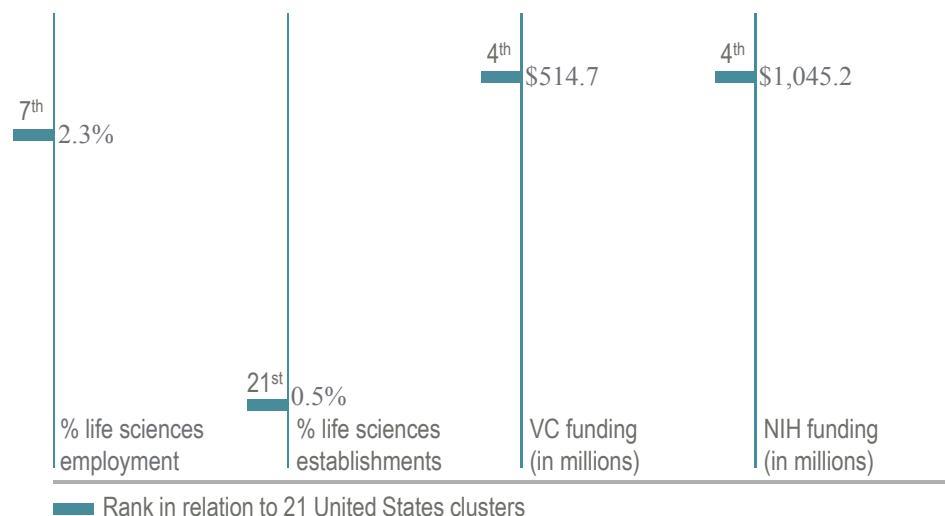
Although Los Angeles and Orange County are very different markets in terms of economic drivers, the life sciences sector in both markets share resources with proximity to world-class learning and research institutions. Two of the five University of California campuses with medical schools are

located in the Los Angeles / Orange County market: UC Los Angeles (UCLA) and UC Irvine. In addition, the region is home to major research universities such as UC Santa Barbara, Cal Tech and the University of Southern California (USC).

From a sheer numbers standpoint, the Los Angeles / Orange County cluster has the largest life sciences-related employment pool in the country, with over 118,000 individuals actively working in the industry. When you consider the large population in the area, however, industry-related employment only makes up 2.3 percent of total workforce.

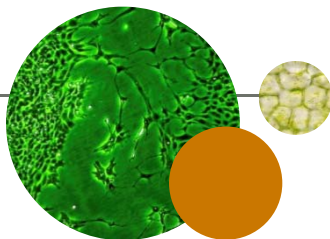
The Los Angeles / Orange County life sciences market is comprised of 5.6 million square feet. Approximately 40.0 percent of the space is located in Los Angeles County, nearly 10.0 percent of the inventory is concentrated in Thousand Oaks alone and the remaining 50.0 percent is in Orange County, primarily in the Airport Area and South County submarkets. Currently, the region leads in medical device manufacturing, but is more an emerging sector with regard to pharmaceutical and biotechnology development and manufacturing.

Los Angeles / Orange County life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

Los Angeles



Overview

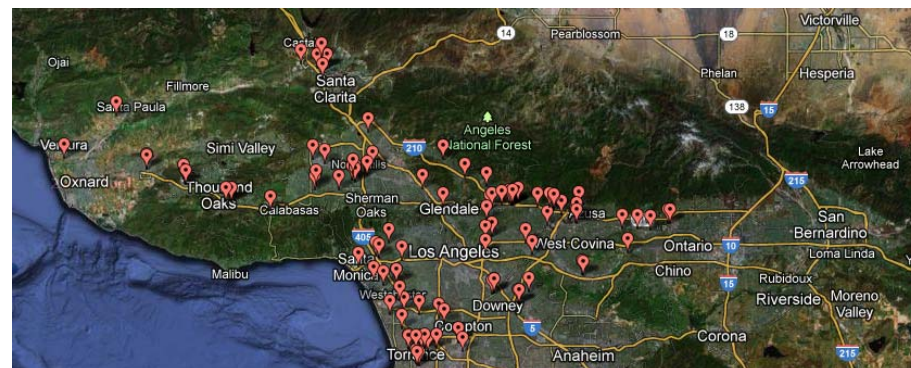
The Los Angeles market is well positioned for future life sciences growth. The region is home to leading research universities and maintains a highly diverse and educated work force. Given the size of the Los Angeles market, life sciences clusters are spread throughout the region and can be grouped together as West Los Angeles, South Bay, Los Angeles North, San Gabriel Valley, and the Santa Clarita Valley. Major private research institutions are also located in the Los Angeles basin: Cedar Sinai Medical Center, the City of Hope National Medical Center, Huntington Medical Research Institute, the Children's Hospital of Los Angeles and Kaiser Foundation Hospital.

The Los Angeles life sciences industry has a general emphasis on medical device firms. Although there are not a large number of pharmaceutical firms, Amgen, the world's largest biotechnology company, is headquartered in the area. There is also significant presence by firms such as Allergan, Abbott Laboratories and Baxter.

The Los Angeles life sciences market covers 2.2 million square feet of laboratory space.¹ Every submarket is unique, based on the presence of major universities, large research institutes, and companies anchored in that market. Life sciences companies in Los Angeles typically focus on business parks with inexpensive space that can be adapted to fit these companies' unique needs.

Outlook

Strong year-to-date earnings by Amgen and Baxter International, both of whom have facilities in Los Angeles, point to robust industry growth ahead. Furthermore, given the strong market fundamentals, the outlook for the life sciences market is very optimistic for the Los Angeles Basin. Local universities will continue to incubate and spin out new early stage life sciences companies who will need to lease space and who will prefer to be near those universities or other biomedical firms. Current construction of lab space is minimal, suggesting that the supply of wet lab space should remain thin in Los Angeles.



Life sciences facilities clustered throughout the Los Angeles area total 2.2M s.f.

PRECISION DYNAMICS CORPORATION (PDC)

Company specializes in clinical identification solutions. PDC signed a 7-year, 44,000 s.f. lease at 27770 N Entertainment Drive in Santa Clarita during the first quarter.

INNOVATION VILLAGE NEAR CITY POLY POMONA

Phase I was 50 acres and now they are expanding it by 100 acres.

XENCOR, INC.

The bio-therapeutics company leased 25,000 s.f. at 111 West Lemon Avenue, Monrovia during the first quarter.

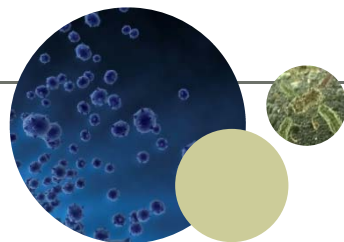
ABAXIS BIOSCIENCES

Abraxis BioScience was acquired by Celgene in 2010. Prior to being acquired, the company bought 35 acres in Culver City and developed a biotech campus.

Rather than having one main cluster where life science firms are located, Los Angeles is a series of smaller clusters that congregate near universities, large biotech firms or research institutes.

¹ Excludes Amgen's 2.2 million square foot campus.

Orange County



Overview

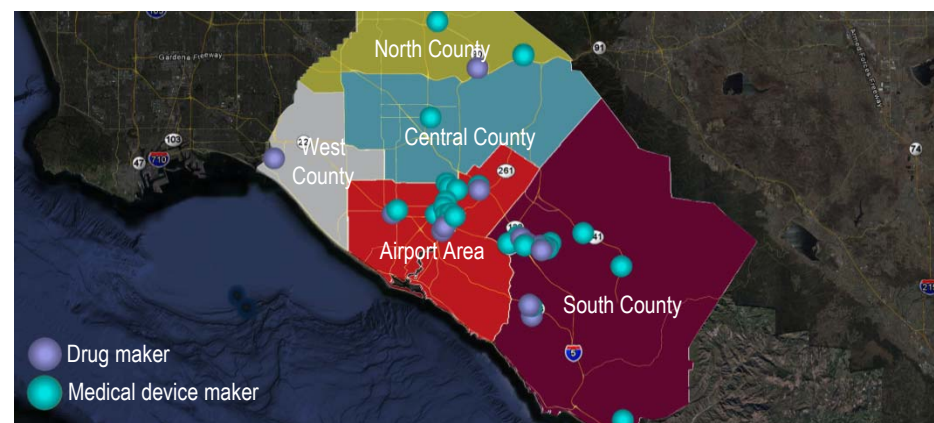
Orange County is a vibrant environment for life sciences companies. Neighboring Los Angeles and San Diego, the county is the third most populous in the state and sixth largest in the country with over 3.0 million residents. In the past, the market has been known for its heavy presence of mortgage-related companies; however, the collapse of the housing bubble and the resulting recession in 2007 led to an economic diversification that has ultimately altered the makeup of the commercial real estate sector. Throughout the market's post-recession recovery, firms from the technology and life sciences industries have been some of the most active in adding jobs to the local economy and backfilling vacancies.

From the founding of Allergan, Beckman Coulter and Edwards Life Sciences in the 1950s, Orange County's life sciences sector has grown to be a dominant industry with over 1,100 companies. Although these companies are scattered in all corners of the county, a majority of the firms are clustered around the Airport Area and South County submarkets, both of which have consistently been the most active commercial office, industrial and flex areas in the market since 2008. Life sciences firms are attracted to the Airport Area for its high profile location and access to appealing workforce demographics, whereas South County provides an abundance of newer lab / flex property and is less than an hour drive to San Diego which offers a deep talent pool and the potential for demand spillover.

There are currently few vacant true biotech space options in Orange County. As the industry has increased its need for specialized space, landlords are becoming more accommodative to the expense associated with the specialization of space. To the extent that each user has specific needs, there are no averages for the price of leased space.

Outlook

With increasing earnings, the life sciences industry in Orange County is projected to remain a major contributor to the economy's job growth and a driver for the commercial property sector. Tenants from other industries have slowly been building confidence in the economy's recovery, which has translated into the amount of large office options dwindling, particularly in the Class A assets around the Airport Area. Although Orange County remains a tenant's market, leasing activity is expected to increase by companies outside of the vibrant technology and life sciences tenants, which should spur more competition for desirable space. Options in South County's flex inventory remain plentiful, but true biotech space is in short supply across the entire Orange County market. With overall vacancy still high in the office and flex inventory, there is no new development in the pipeline aside from two large, build-to-suit projects for companies outside of the industry. Life science users looking for space will continue to be drawn to the large campus-style options that are concentrated near the existing clusters of life sciences firms.



Clusters of Orange County's largest life sciences firms

ALCON RESEARCH

The ophthalmic company signed two of the market's largest leases in the past year with 210,000 s.f. at 15800 Alton Parkway in Irvine and 184,000 s.f. at Serrano Creek Center in Lake Forest.

9401 & 9501 JERONIMO

The two-building, 166,413 s.f. complex was purchased by Chapman University to expand its Crean School of Health and Life Sciences. Chapman plans to spend an additional \$24.0 million to provide labs, classrooms and office space for the school's graduate students.

MASIMO MEDICAL

The medical technology company is in the market for 200,000 s.f. somewhere between the Airport Area and South County's Irvine Spectrum Area.

LABCORP

The medical laboratory testing and services company is in the market for 100,000 s.f. around the Airport Area, particularly interested in single-story product.

Orange County's life sciences firms are clustered in the Airport Area and South County submarkets.



Industry leading companies, a highly skilled workforce and world-class research capabilities make Minneapolis-St. Paul the Midwest leader in medical device manufacturing.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Within the United States, life sciences-focused clusters are at various stages in their evolution. The Northeast and California continue to dominate with their extensive university networks and deep labor pools, but, more and more, emerging clusters offer great talent coupled with more competitive real estate opportunities.

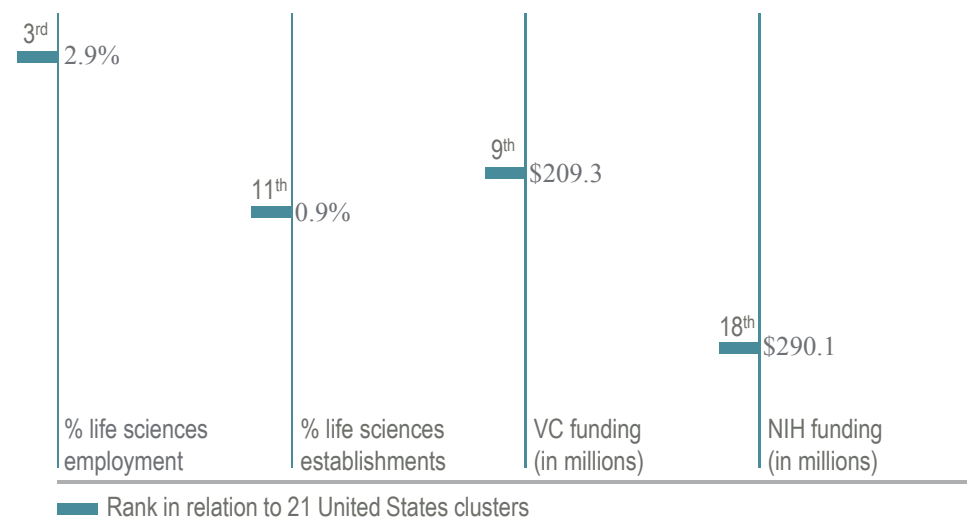
Minneapolis-St. Paul market overview

Minneapolis-St. Paul is particularly strong in medical device manufacturing, ranking second in the nation with slightly more than 38,000 employed in this subsector. A number of major medical device manufacturers such as Medtronic, St. Jude Medical, Smiths Medical and Boston Scientific are either headquarter or have major operations in the Twin Cities.

Locally, the University of Minnesota is a key driver of the life sciences industry. This is true not only because it consistently develops a large pool of skilled workers from which local life sciences companies can draw from, but also because of its R&D capabilities. The Academic Health Center at the University of Minnesota receives more than \$321.0 million annually in sponsored research, and the University of Minnesota has averaged slightly more than \$230.0 million annually in National Institutes of Health (NIH) funding since 2002. Overall, the state of Minnesota ranked 13th in NIH funding in 2011, and number one in the Midwest on a per capita basis. With federal funding not likely to increase in the near future there is a push to attract more funding from the private sector.

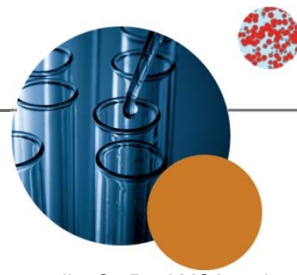
In an effort to improve the business climate and help attract investment, multiple steps have been taken locally. In addition to the expansion of its R&D tax credit, Minnesota adopted an Angel Investor Fund in July 2010. The initiative was championed by the BioBusiness Alliance of Minnesota, a subsidiary of LifeScience Alley, which recognized the capital needs of many emerging start-ups. The program is already fully subscribed for 2012 and funding is set at \$12.0 million annually through 2014. Many are advocating an annual increase in the tax credit as a result of the program's subscription rate. Additionally, both the Minnesota Science and Technology Authority Strategic Plan and the Minnesota Innovation Partnership were created to help turn innovative ideas into businesses and commercial successes. However, generating funding for the Minnesota Science and Technology Fund has been a challenge as the legislature has yet to be convinced to do so.

Minneapolis-St. Paul life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

Minneapolis-St. Paul

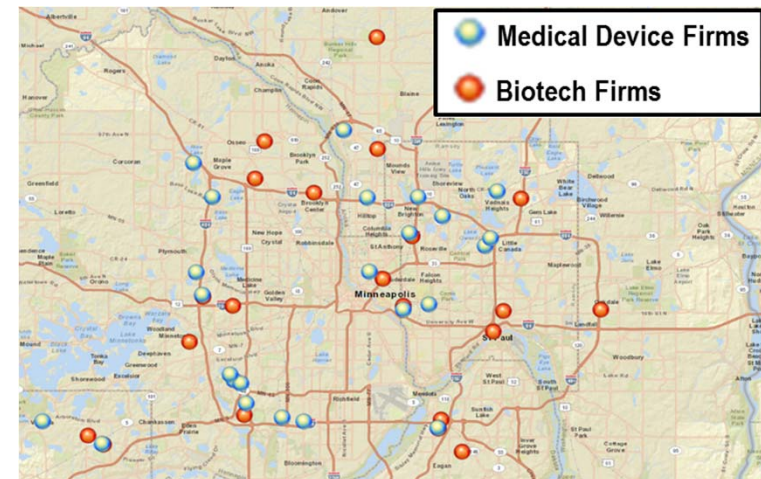


No singular life sciences corridor exists within the Minneapolis -St. Paul MSA, rather a majority of companies occupy space throughout the suburban submarkets. Many are located along the I-694 corridor in the Northeast and Northwest submarkets including medical device manufacturers Medtronic, St. Jude Medical, Boston Scientific and Smiths Medical. The I-494 corridor in the West and Southwest submarkets is also home to a significant number of medical device manufacturers and biotech companies. Not surprisingly, these areas have seen the most activity from both start-up companies and spin-offs from the larger players, mostly due to their proximity to a large pool of skilled workers.

Consolidation of space has been common among some of the larger medical device firms in the last year. Medtronic vacated 100,000 square feet of office and lab space in the Northeast submarket in late 2011 and Boston Scientific is consolidating its space in the Twin Cities after its acquisition of Atritech in early 2011. Currently Boston Scientific has a combined 125,000 square feet of space for lease in two buildings: 25,000 square feet in the Northwest submarket and 100,000 square feet in the Northeast submarket. Cheaper manufacturing options overseas, uncertainty in the current U.S. Food and Drug Administration (FDA) approval process and the potential for a new medical device tax are significant factors contributing to the current landscape.

Despite some of these challenges and uncertainties, there are a number of life sciences companies either actively in the market for space or planning expansions of existing space. Synovis Life Technologies, purchased by Baxter International in February of this year, is currently in the market for 80,000 square feet of office, lab and warehouse space. Ottobock, a manufacturer of prosthetics, is looking for 120,000 square feet of office and warehouse space in the West submarket. Pharmaceutical company Upsher-Smith Laboratories has announced plans for an approximate 130,000-square-foot expansion of their existing headquarters in Maple Grove. The National Bone Marrow Institute is in the market for 325,000 square feet of office space and considering either moving its headquarters to the Minneapolis CBD or remaining in the Northeast submarket. Additionally, some significant leasing deals have already occurred in 2012; Tornier, Starkey Hearing Technologies, and TRIA Orthopedic each signed leases in the Southwest submarket.

Another highlight in the local life sciences industry is the scheduled completion of The Cancer and Cardiovascular Research Building in the spring of 2013. The building will act as the gateway to the University of Minnesota's Biomedical Discovery District, a \$292 million research project resulting from a funding program approved by the state of Minnesota in 2008. The long-term vision for the district includes additional university facilities as well as private sector partners. In future years this initiative has the potential of attracting private sector companies to cluster in or around the Biomedical Discovery District, located within the Minneapolis city limits.



Twin Cities
Top Life Sciences
Companies

3 SIGNIFICANT DEALS

Tornier signed 56,000 s.f. at 10801 Nesbitt Avenue S in Bloomington; Starkey Hearing Technology signed 42,278 s.f. at Prairie Oaks Corporate Center; TRIA Orthopedic signed 32,400 s.f. at Northland Plaza

UPSHER-SMITH LABORATORIES

is planning a 130,000 s.f. expansion of their HQ in Maple Grove
AORTECH moved into its custom built 13,000 s.f. manufacturing facility in Rogers in late 2011

LARGE AVAILABILITIES

101,000 s.f. building at 8299 Central Ave NE with high-tech lab and clean room space; 79,000 s.f. of lab and clean room space for lease at 1185 Willow Lake Blvd; 25,000 s.f. of clean room sublease space at 3750 Annapolis Lane N

3 REQUIREMENTS

The National Bone Marrow Institute is in the market for 325,000 s.f. of office HQ space; Ottobock is in the market for 120,000 s.f. of office and warehouse space; Baxter is in the market for 80,000 s.f. of office, lab and warehouse

There is long-term potential for private sector companies to cluster in or around the University of Minnesota's Biomedical Discovery District.

Activity key:

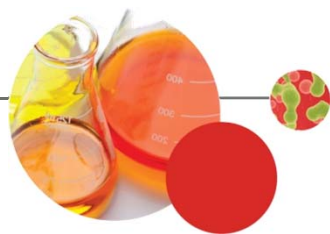
Leasing

Development

Sales

Tenants in the market

Large blocks of space



10

Seattle's life sciences community remains lively with expanding cancer and drug research companies.

Global trends

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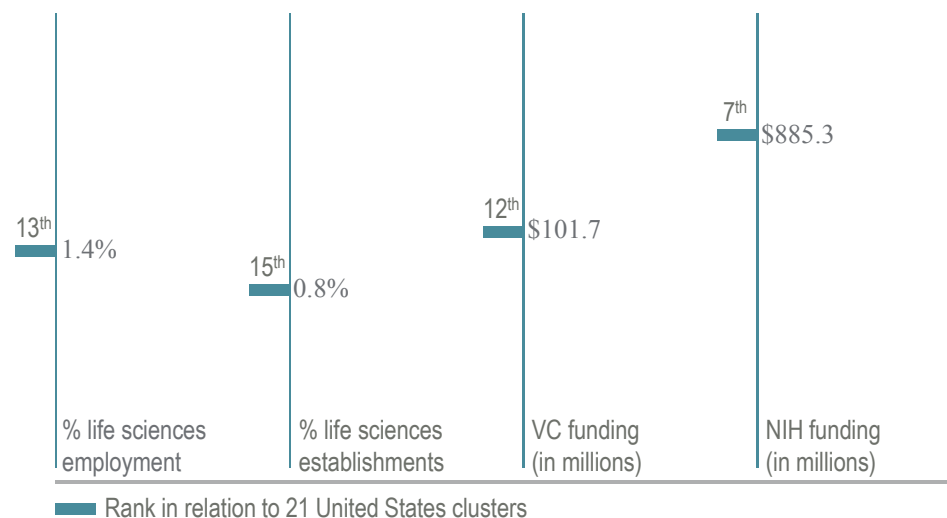
Seattle market overview

Seattle has one of the fastest growing life sciences markets in the nation and has become one of the core cancer research markets in the nation. Puget Sound's life sciences is comprised of nearly 1,000 firms employing more than 22,000 directly in the industry, with an additional 191,000

people employed in the hospitals and the medical field. One of the distinguishing features of the Seattle-area life sciences market is that very little manufacturing is done in the region. Nearly all Puget Sound-area life sciences industry activities are based on research and development. Unlike areas with a strong concentration of life sciences manufacturing jobs, when a growing Puget Sound company is purchased by a larger company, the frequent trend has been the employees and the companies to remain intact and local to Seattle. This is the case with many companies like Zymogenetics, which was acquired by Bristol-Myers Squibb in 2010; Blue Heron, which was acquired by OriGene Technologies in 2010; and Sonosite, which is being acquired by Fujifilm.

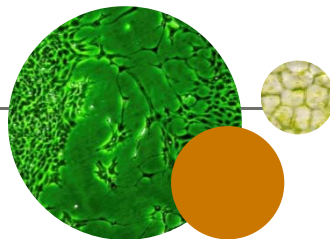
At 4.6 million square feet the Seattle life sciences market is a smaller market with a high density of companies situated in its two core markets of South Lake Union and Bothell. Seattle has a dynamic mix of life sciences companies both private and public who serve a vast array of activities from cancer research to drug research. The University of Washington Medicine, Fred Hutchinson Cancer Research, Seattle Cancer Care Alliance, Seattle Genetics, Amgen and Bristol-Myers Squibb all are staples of excellence in the market and have seen significant growth over the last decade. A major contributor to Seattle's life sciences growth can be attributed to industry leading research coupled with generous funding by some of the world's largest philanthropic organizations, like the Bill & Melinda Gates Foundation.

Seattle life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

South Lake Union



Overview

The South Lake Union area is Seattle's life sciences epicenter – with nearly 2.8 million square feet of life sciences space, it makes up nearly half of Seattle's overall life sciences market. South Lake Union is situated just north of Seattle's CBD and offers a more urban campus feel to its buildings than its traditional CBD brethren to the South. This market is dominated by life sciences and tech companies who thrive on an amenity-rich environment to maintain and increase employment retention and company growth. South Lake Union has seen a continual downward trend in vacancy over the last two years and currently is nearing 1 percent vacancy which has raised concern that new life sciences development has not kicked off yet. Nevertheless, the downward pressure on vacancy has escalated lab rents to the highest levels it has ever seen, with some spaces as high as \$55.00 per square foot NNN. Rental rates should continue to rise as space demand remains constrained.

Outlook

The South Lake Union market is already a robust and stable market with high occupancy and rising rents. However, demand is also on the rise and there is no new construction underway to meet it. With limited availability tenants may look to traditional office space for life sciences conversion which other tenants like Dendreon have done at Russell Investments Center.

PRESAGE BIOSCIENCES

leased 9,756 s.f. at Fairview Research Center I in South Lake Union.

NOVO NORDISK

leased 12,764 s.f. at South Lake Union's Fairview Research Center I. The lease brought the property to 100 percent occupancy.

FAIRVIEW RESEARCH CENTER II PROPOSED

140,000 s.f. life sciences building.

THE OMEROS BUILDING

The 151,225 s.f. research facility has 43,068 s.f. of contiguous space available.

The South Lake Union market has quickly become the hottest market in the Seattle area, attracting major tech companies and life sciences companies to its rich amenity base and walkability.

Bothell

Overview

Bothell is the second largest life sciences market in the Seattle area at roughly 800,000 square feet spread between its two core areas of Canyon Park and North Creek. Bothell is a tertiary suburban market east of Seattle and north of Bellevue and is set up in two distinct business park layouts. With a suburban campus feel, higher parking ratios and larger floor plates, it offers life science tenants the ability to maximize efficiency by not splitting up researchers onto multiple floors and also taking advantage of significantly more discounted rates than South Lake Union, currently averaging around \$27.00 per square foot NNN. Major firms such as Seattle Genetics, Amgen, HaloSource, SonoSite and Alder Biopharmaceuticals occupy this market which has become a viable second option for Seattle-area life science users.

Outlook

Bothell's life sciences market has a bright future ahead of it as it continues to grow and add more tenants to its roster. With limited availability in the South Lake Union area, Bothell should see significant spillover demand in the coming quarters as expansion space is readily available here. Bothell's multitude of life sciences companies offers a cohesive symbiotic tenancy among life sciences users who all benefit from cheaper rates, state-of-the-art product, efficient floor plates and well-designed infrastructure.

CEPHIAD

leased 39,600 s.f. at Canyon Park Business Center in Bothell.

VERATHON

renewed 97,216 s.f. at North Creek.

CHILDREN'S RESEARCH INSTITUTE

is in the market for 20,000 s.f. and focused on the Seattle office market.

217th PLACE RESEARCH CENTER

The 67,799 s.f. research facility is fully vacant and available.

Bothell is the primary suburban life sciences market, attracting companies who need large floor plates, high parking ratios and a less costly alternatives for lab space.



Westchester / New Haven ranks No. 11 among U.S. life sciences clusters; new incubator developments are driving activity.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Within the United States, life sciences-focused clusters are at various stages in their evolution. The Northeast and California continue to dominate with their extensive university networks and deep labor pools, but, more and more, emerging clusters offer great talent coupled with more competitive real estate opportunities.

Westchester / New Haven market overview

Although the Westchester / New Haven market is struggling to regain momentum and find footing in the current economic climate, the life sciences are a bright spot. The region benefits from unparalleled access to talent and innovation. The existence of a strong and educated workforce alongside a plethora of higher educational institutions and research hospitals position Westchester

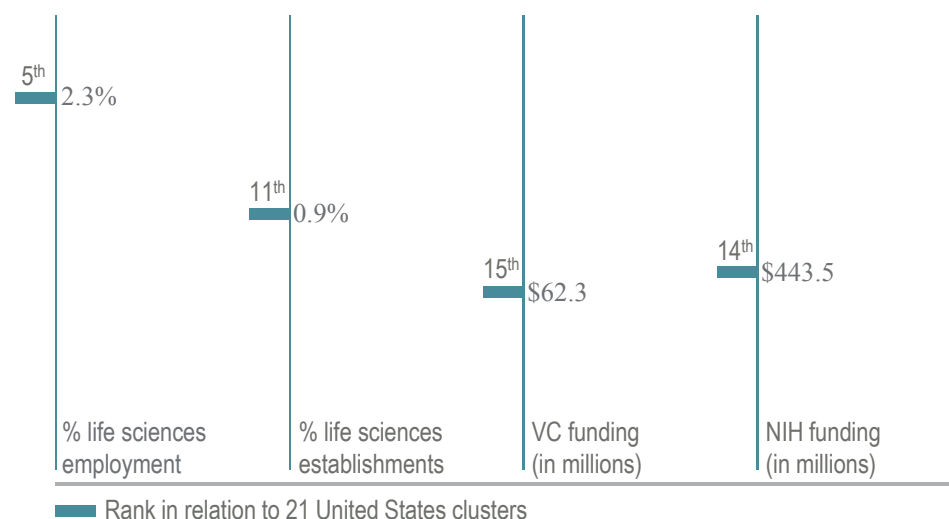


/ New Haven strongly for growth in the life sciences arena, priming the region for emergence as a competitive industry cluster.

The Westchester / New Haven region, which currently ranks 11th among U.S. life sciences clusters, employs more than 17,000 workers in life science industry, which represents 2.3 percent of the region's total employment. The New Haven, CT MSA accounts for about 56.0 percent of this life science employment whereas Westchester County, NY accounts for 44.0 percent. Since the close of 2011, employment in life science sectors has increased 0.6 percent. Although the growth has been somewhat muted, it is outpacing employment growth in many other areas more typically associated with regional economic growth.

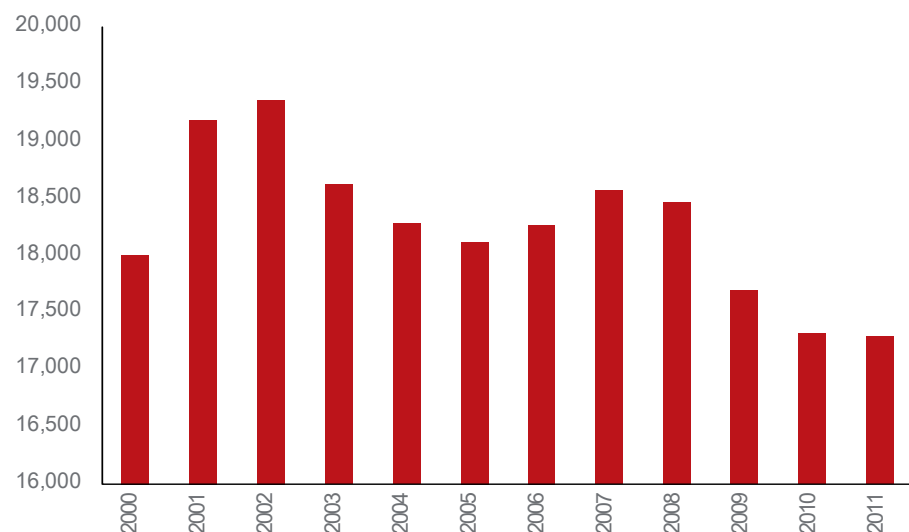
There are currently more than 500 life sciences establishments in the region and, in the past few years, Westchester and New Haven have become target locations for life science and biomedical companies. State and local government entities in both Connecticut and New York have increased efforts to encourage investment in life sciences and the development of incubators through incentive engagement and facilitating funding. Venture capital funding in the region totaled \$62.3 million for 2011 while NIH funding funneled \$443.5 million into life science-related investment. The consistent funding and support in a region with an existing infrastructure favorable to the life sciences is allowing this corridor between well-known life science hubs Boston and New Jersey to emerge on its own as a formidable contender for life science development.

Westchester / New Haven life sciences scorecard



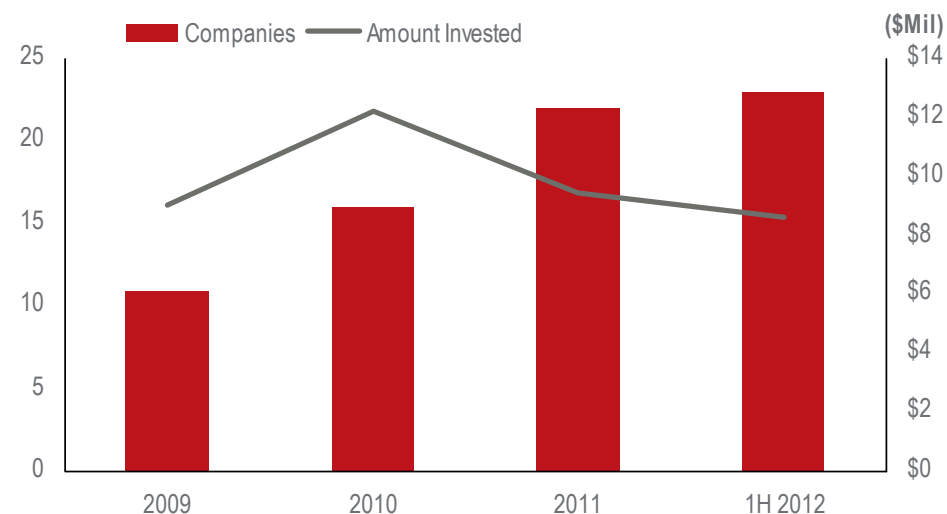
Life sciences market analysis

Life science related employment



Source: Bureau of Labor Statistics

Connecticut grants and funding (bioscience and related clean-tech and advanced materials)



Source: Connecticut Innovations

*Ardsley
Park,
Ardsley,
NY*



*Downtown
Crossing,
New Haven,
CT*

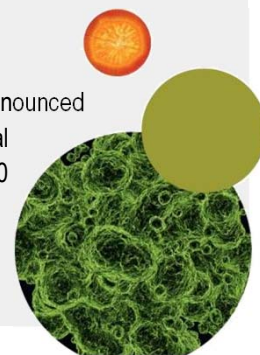
Market movers

Acorda Therapeutics at Ardsley Park – Westchester, NY

- Acorda Therapeutics moved into its new corporate headquarters at the Ardsley Park life sciences campus in Westchester, NY in July. The four-building campus is managed and leased by BioMed Realty Trust and has 258,040 square feet of office and laboratory space. Acorda occupies 138,000 square feet in two buildings. Another 500,000 square feet is earmarked for future development, and existing buildings on the campus are undergoing a renovation program during the next 12 months.

Alexion Pharmaceuticals at Downtown Crossing – New Haven, CT

- After departing New Haven seven years ago, Alexion Pharmaceuticals announced in June it would be the anchor tenant for the new life sciences / biomedical Downtown Crossing in New Haven, CT. The company will occupy 325,000 square feet in the 426,000-square-foot office and laboratory building intended to facilitate New Haven's role as a life sciences / biotech hub. Construction is slated to commence in 2014 with a 2016 completion.



Westchester, NY

Overview

Since 2010, Westchester County has put out an aggressive effort to establish the market as a life sciences hub. Two major campaigns characterize this effort: “NY BioHud Valley” and “Westchester County: New York’s Intellectual Capital,” which both emphasize Westchester’s role as a knowledge center. The campaigns have made local funding available for companies that promise job creation, and there are several major life sciences users that have utilized incentives to expand their footprint. Acorda Therapeutics is one example, having received up to \$5.2 million in tax credits to remain in Westchester. Histogenics also recently purchased two former office buildings that they will adapt into research and development space. Likewise, healthcare providers such as WestMed and Memorial Sloan Kettering are also expanding and converting buildings into healthcare facilities.

Outlook

Life sciences momentum is fueling various projects in Westchester County. There are two major construction projects in early planning stages. New York Medical College is building a \$12.6 million biotechnology incubator, which could create as many as 215 jobs. The project received a \$4.0 million boost in funding at the end of 2011. Adjacent to this incubator, Fareri Associates also has plans to build a \$500.0 million, 2.0 million-square-foot park for biotech and medical tenants, creating as many as 5,000 permanent jobs.

EPICEPT

Epicept renewed 9,805 s.f. of office and laboratory space at 777 Old Saw Mill River Road in the second quarter 2012.

104 CORPORATE PARK DRIVE

HistoGenetics purchased 104 Corporate Park Drive (118,000 s.f.) for \$12.0M, or \$102 p.s.f.

CONTRAFECT

ContraFect is investing \$3.5M in a 15,000 s.f. office and laboratory build-out at iPark (28 Wells Avenue) in Yonkers.

767 OLD SAW MILL RIVER ROAD

76,000 s.f. of space is available at this building at BioMed Realty’s Landmark at Eastview campus.

Westchester County offers access: Access to world-class research institutions and programs, access to capital and access to competitively priced real estate.

New Haven, CT

Overview

New Haven is home to more than 40 life sciences related companies, with direct accessibility to related research programs at Yale University and Yale / New Haven Hospital. Incentives and legislation have been funneled through Connecticut since prior to the recession, helping the life sciences industry to remain a driver despite unfavorable economic conditions. That said, payrolls have struggled. Life sciences employment in the metro is down 1.9 percent year-over-year. Life sciences companies still view New Haven as an attractive hub with low lease rates compared to those of other regional hubs like Boston and New Jersey / New York City. Recently, Durata Therapeutics, based in New Jersey, announced an 18,000-square-foot lease in Branford, CT for research and development use. In addition, Greenleaf Biofuel’s New Haven 8,000-square-foot plant is nearly complete, scheduled for full operation in Fall 2012.

Outlook

Governor Malloy’s 2011 “BioScience Connecticut” initiative aims to spur life sciences development, creating 16,400 jobs by 2037. With statewide efforts like this in place, New Haven will benefit from its strong life sciences infrastructure and continue to grow. For example, Alexion Pharmaceuticals became another beneficiary of the “First Five” initiative and will receive \$51.0 million in incentives to become the anchor tenant at Downtown Crossing, a new biomedical facility in New Haven.

LOGISTICARE

Logisticare leased 8,900 s.f. of space at 127 Washington Avenue in the second quarter 2012.

688 E. MAIN ST

Massey Properties, LLC purchased the R&D facility Orchard Business Park (32,693 s.f.), for \$765,000, or \$23 p.s.f.

ALEXION PHARMACEUTICALS

Alexion committed to 325,000 s.f. to anchor the proposed biomedical facility, Downtown Crossing.

DOWNTOWN CROSSING

101,000 s.f. remains vacant at 100 College Street, the 10-story biomedical building in planning.

“By becoming a leader in bioscience, Connecticut can again be at the forefront of an economic renaissance.”
-Governor Malloy

12

The Chicago area has developed a reputation as a hub for research and innovation.

Global trends

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Chicago market overview

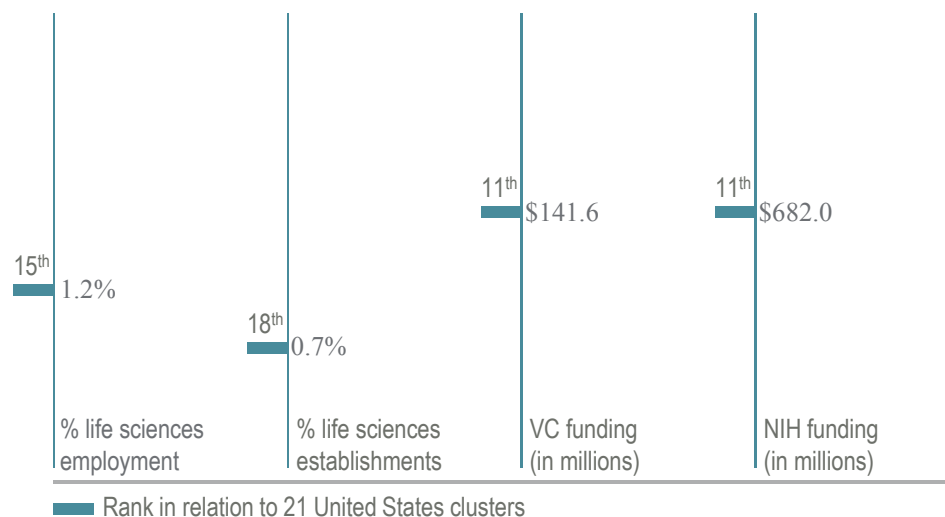
Since the opening in 1946 of Argonne National Laboratory, the first national science and engineering research laboratory, the Chicago area has developed a reputation as a hub for research and innovation. Headquartered in the Chicago area are large life sciences companies

including Abbott Laboratories, Astellas, Baxter, Hospira, Takeda and Walgreens. These companies, and many smaller life sciences firms, are located in the north suburban submarket. The area benefits from large life sciences-related employment of nearly 45,000 individuals employed in pharmaceutical, biotech and medical device disciplines.

The metropolitan area is home to several leading universities and institutions. These include Northwestern University, the University of Chicago, the Illinois Institute of Technology (IIT) and the University of Illinois at Chicago (UIC). The area also attracts graduates from other schools in the state, such as the University of Illinois at Urbana-Champaign and Southern Illinois University School of Medicine. The area's universities are among the factors that identify Chicago as a life sciences cluster.

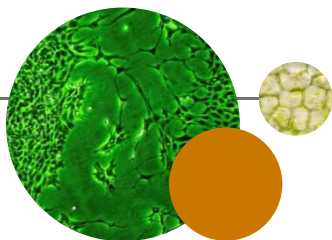
Research is a heavy point of emphasis at area centers like the International Institute of Nanotechnology at Northwestern, the Center for Pharmaceutical Biotechnology at the University of Chicago and the Medical Imaging Research Center at IIT. The Illinois Medical District was created in 1941. Since then the area has become rich with hospitals, medical centers and research facilities including the biotech incubator, Chicago Technology Park. The 56-acre park features a 56,000-square-foot research center for emerging ventures and roughly 118,000 square feet of graduate and other facilities to accommodate more established companies.

Chicago life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

North / Northwest



Overview

A concentration of life sciences companies are found in the North suburban submarket. Until recently, the long-standing presence of some of the largest pharmaceutical companies in the world has attracted related companies specifically to this area. In the last several years, both Astellas and Takeda Pharmaceuticals have made long-term commitments to the area by each building new North American headquarters of 445,000 square feet and 630,000 square feet, respectively. More recently, medical device maker Carefusion relocated to 150,000 square feet in Vernon Hills

Although life sciences activity had previously been limited the North suburban submarket, the July 2012 acquisition of Catalyst Rx by SXC Health Solutions to form Catamaran has expanded the industry into the Northwest submarket. As a result of this merger, the two companies will consolidate headquarters to occupy 250,000 square feet in Schaumburg with the potential to expand by an additional 50,000 square feet during the first years of term.

In 2011 construction began on The Illinois Science + Technology Park in Skokie. The result of a collaboration between Illinois Science and Technology Coalition, iBio and China's Shanghai Bio Pharmaceuticals Association, the 23-acre campus will provide laboratory, office and conference space for life science-focused companies. Once fully complete, the site will offer a total of 2 million square feet of advanced facilities.

Outlook

Activity in the coming months will be fueled by AbbVie, Abbott Laboratories' most recent spin-off, as well as the newly merged Catamaran venture. Although it is not yet known what AbbVie's impact will be on the market, if this spin-off goes down a similar path as Hospira, when it spun-off from Abbott, it could require its own space.

Additionally, as corporations continue to take a hard look at their financial health, announcements surrounding employment levels (and subsequent space needs) will be monitored closely. Many global corporations, looking to streamline operations after a merger or in general, have been cutting jobs in recent years. Takeda, for example, announced global layoffs earlier this year that would impact operations in the United States. Other pharmas, meanwhile, are in expansion mode and have been beating market expectations quarter after quarter. As M&A activity continues to heat up, it will not be shocking to find widely varying space needs in the near- to mid-term.



Takeda campus at the intersection of I-294 and Lake Cook Road in Deerfield

CATAMARAN

In August of 2012 a newly formed venture between SXC Health Solutions and Catalyst Rx signed a new lease in Schaumburg for 250,000 s.f.

CAREFUSION

Medical device producer Carefusion signed a new lease in May 2012 in Vernon Hills for 150,000 s.f.

ASTELLAS

In June 2012, Astellas Pharma US completed construction on its new 445,000 s.f. North American headquarters in Northbrook.

WALGREENS

Walgreens is in the market for approximately 50,000 s.f. This comes on the heels of signing a lease for 56,000 s.f. at 1000 Lakeside in Bannockburn earlier in the year.

Headquartered in the Chicago area are large life sciences companies including Abbott Laboratories, Astellas, Baxter, Hospira and Takeda, as well as druggist Walgreens.

Activity key:

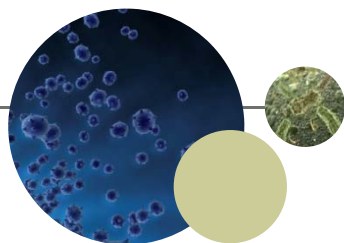
Leasing

Development

Sales

Tenants in the market

Large blocks of space



After several years of stagnation, Denver area bioscience companies are benefiting from renewed interest from investors and partners.

Global trends

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Denver market overview

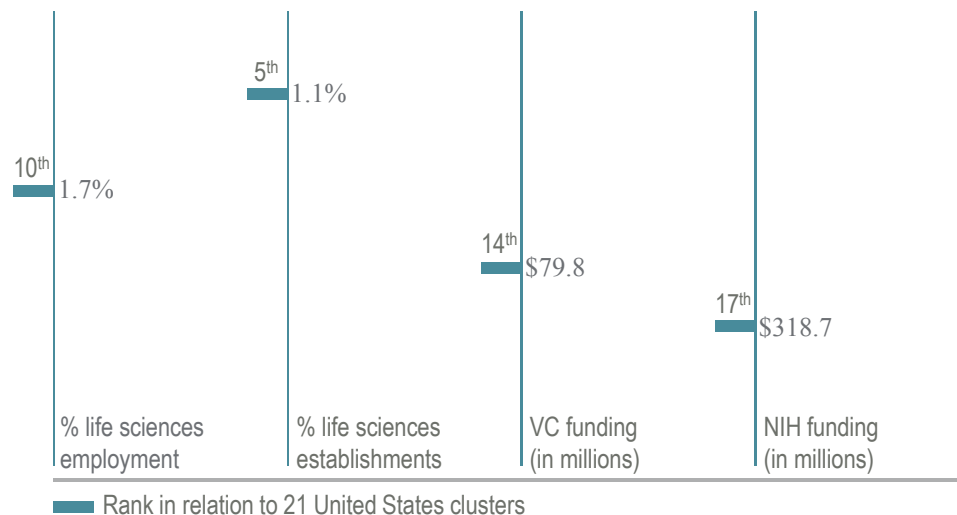
Metrowide, nearly 25,000 people are employed in life sciences-related occupations in the Denver area. Ten higher education institutions operate life sciences programs and research resources. Among them are Colorado State University, the University of Colorado at Boulder and the Colorado

School of Mines. The largest research facility in Colorado is the Fitzsimons Life Science District, located in Aurora. With swift growth in the industry over the past few years, Fitzsimons has created a central hub for research dedicated to life sciences, healthcare and education. The state is home to over 1,200 companies in the bio-related fields of medical devices, pharmaceuticals, agricultural and traditional biotechnology including Allos Therapeutics, Amgen, Array Biopharma, Sandoz, Somalogic and OPXBIO.

The Colorado BioScience Association works to further Metro Denver and Colorado's life sciences community. Aiding this effort are Colorado programs such as grants, sales tax exemptions and support for start-up companies. The state has five venture firms predominantly or solely focused on funding local life sciences companies.

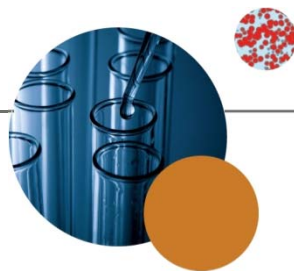
Denver's life sciences industry is trending positively. Budding start-ups have the intellectual and innovation resources needed to develop into successful and solid companies, while established companies enjoy access to resources with the presence of the Fitzsimons Life Science District and the Anschutz Medical Campus. A new 37,000-square-foot accelerator building was constructed at Fitzsimons and has 9,715 square feet remaining for lease. However, it is evident that the market requires investors and landlords who specialize in the development of research facilities in order to meet future demand.

Denver life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

Northwest / Boulder



Overview

Although industry activity is spread throughout the entire Denver metro area, the Northwest and Boulder submarkets, encompassing the cities of Broomfield, Boulder, Lafayette, Louisville, Westminster and Longmont, are the most prominent. The University of Colorado at Boulder anchors these submarkets as one of the leading research universities in the country. In addition to offering undergraduate students the chance to make money while gaining research experience (Bioscience Undergraduate Research Skills and Training), the state of Colorado along with the University of Colorado fund the State Bioscience Discovery Evaluation Grant program. This program focuses on development-oriented research in order to accelerate commercialization by reducing inventions to operational practice and validating their ability to address significant market applications.

The Northwest and Boulder submarkets are home to over 250 life sciences companies. Companies in the cluster are typically smaller in nature, some examples include Sophono, Bolder Biotechnology, BiO2 Medical, Inc., Ventria Bio Science, UrgentRx and Solix Biosystems. These and other companies in the Northwest and Boulder markets employ over 12,000 people, just shy of half of the state's life sciences employment.

Outlook

Northwest Denver (including Boulder) is a growing region for the life sciences industry and has made remarkable progress over the past decade. It is now considered the main bioscience cluster in Colorado, despite the majority of life science companies in this submarket being small in size (5,000 to 15,000 square feet). With the expanding research labs at the University of Colorado, start-ups and more mature companies alike will continue to benefit from their presence.

Overall activity in the Northwest area has been fairly static with only a handful of companies expanding such as Biodesix and Agilent Technologies. This lack of new leasing activity is viewed as temporary and transactions should increase in 2013 following the election. One continuing challenge for earlier stage companies is finding existing second generation lab space in the 2,000- to 10,000-square-foot range. When such space becomes available, it is typically absorbed very quickly. It is the predominate opinion of those active in the industry that the concentration of bioscience companies in the area will continue to grow due to the current industry presence and desirable location which assists with recruiting and retention of skilled employees.

In line with macro industry trends, several companies have consolidated or formed partnerships. Cortex Pharmaceuticals and Pier Pharmaceuticals of Louisville merged and Pier has become a

Wholly owned subsidiary of Cortex. Spectrum Pharmaceuticals acquired Allos Therapeutics of Westminster and Allos has become a wholly owned subsidiary of Spectrum. Accera of Broomfield announced a partnership with Nestle Health Science, and Array BioPharma of Boulder has formed a strategic alliance with Genentech, a member of the Roche Group. It is expected that additional companies will follow suit and form similar partnerships and mergers.

2 RECENT DEALS

Allos Therapeutics / Spectrum Pharmaceuticals renewed its lease for 31,248 s.f. at 11080 Circle Point Road in Westminster.

BiOptix renewed its lease for 13,965 s.f. at 1775 38th Street in Boulder.

3 LARGE BLOCKS

2860 Wilderness Place
60,000 s.f. office/lab

1795 Dogwood Street
50,000 s.f. office/lab

2950 Wilderness Place
30,000 s.f. office/lab

2 RECENT SALES

Mountainview Corporate Center in Broomfield sold for \$92M, or \$199 p.s.f. Hines was the seller, Westfield was the buyer.

Diagonal Tech Center in Longmont sold for \$6.9M, or \$55 p.s.f. Bank of America was the seller, Goff was the buyer.

4 ACTIVE TENANTS

Solix Biosystems out for 12,000 s.f.

Sophono out for 11,000 s.f.

mBio Diagnostics out for 10,000 s.f.

Isogenis out for 7,000 s.f.

The Northwest and Boulder submarkets are the most prominent and home to over 250 life sciences Companies.

Activity key:

Leasing

Development

Sales

Tenants in the market

Large blocks of space



The life sciences industry is a bright spot among Ohio's local economy due to steady job growth and company expansions across the state.

Global trends

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Cleveland / Columbus / Cincinnati market overview

Although life sciences activity is scattered throughout the state of Ohio, a majority of industry representation and output comes out of the northeastern, central and southwestern regions of the state, with activity clustering around the major cities of Cleveland, Columbus and Cincinnati,

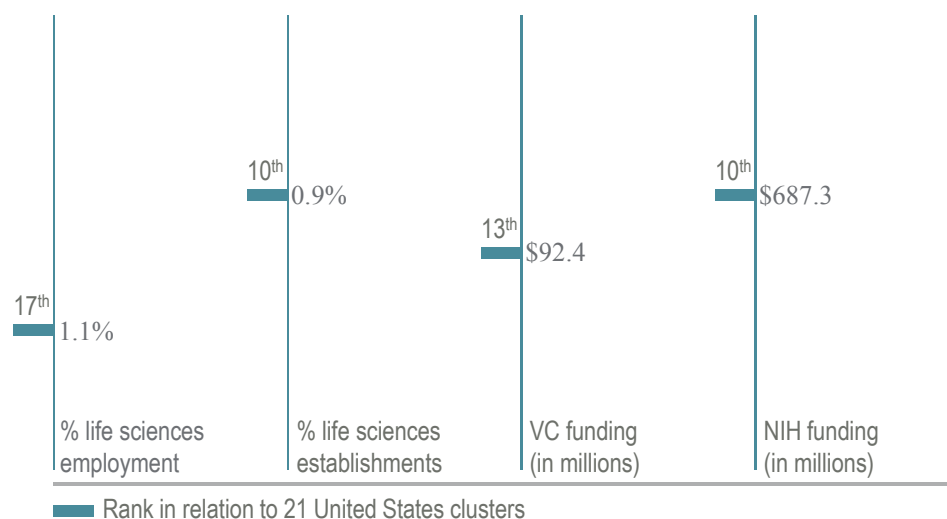


respectively. In addition to general business resources associated with these metropolitan areas, research and academic institutions proximate to these cities provide industry-specific resources including funding opportunities and research manpower. These three clusters account for just under 30,000 individuals employed in the life sciences, at roughly 1,300 company locations.

In 2011 institutions and companies in Cleveland, Columbus and Cincinnati collectively attracted \$687.3 million in NIH grants. Five of Ohio's institutions – Case Western University, Ohio State University, University of Cincinnati, Cincinnati Children's Hospital and the Cleveland Clinic – consistently rank among the top NIH funding recipients. These, and other research institutions, have formed several collaborative efforts in order to facilitate research efforts, among them the Global Cardiovascular Innovation Center, the Center for Stem Cell and Regenerative Medicine and the Biomedical Structural, Functional and Molecular Imaging Enterprise. In August 2012, universities from each of the three metros – Case Western, University of Cincinnati and Ohio State University – announced a statewide collaboration to streamline processes around clinical trials.

Several large life sciences players have facilities outside the aforementioned three major clusters. Abbott Laboratories announced plans in early 2012 to invest \$270.0 million into its nutrition plant in Tipp City and Mound Laser & Photonics Center announced it would invest \$400,000 into its facility in Kettering. Other major life sciences occupiers throughout the state include Charles River Laboratories, Amylin, Alkermes and Eurand.

Cleveland / Columbus / Cincinnati life sciences scorecard



Cleveland / Columbus / Cincinnati

Overview

Cleveland is home to just over 500 life sciences company operations, among them BenVenue (a subsidiary of Boehringer-Ingelheim), Orbital Research, Cleveland Medical Devices and Norman Noble. In 2012 alone the cluster attracted three new companies and five company expansions. Among the expansions was a \$4.3 million investment for a new U.S. headquarter facility from Valtronic Technologies and a \$163,000 expansion by Synapse Biomedical. Cleveland is supported by two major research and academic institutions, Case Western University and the renowned Cleveland Clinic. In August 2012 Case Western University announced that it was the recipient of a \$64.6 million federal grant to facilitate innovations from bench to bedside, the first award of its kind in Northeast Ohio.

The Columbus life sciences sector is bolstered by the large presence of healthcare facilities and as such one-third of the 377 industry-related companies are in the medical and diagnostics subsector. Pharmaceutical and medical supply distributor Cardinal Health, one of the state's largest companies, is headquartered in nearby Dublin. In early 2012 Quantum Health, a manager of health benefits for corporations, announced its decision to maintain operations in Columbus, even adding 50 new jobs, due in large part to \$7.0 million in city and county incentives. According to Quantum's CEO, the company will add an additional 475 jobs by 2014.

Cincinnati houses roughly 440 life sciences company operations, employing about 10,500 individuals. A majority of companies are in the medical and diagnostics and R&D subsectors, although the area enjoys sizable representation among all sectors of the industry. Five companies announced expansions during the first half of the year, including Valued Relationships, Integra LifeSciences, Hardy Diagnostics, Forest Pharmaceuticals and Cincinnati Test Systems.

Outlook

Life sciences clusters in Ohio are still enjoying funding opportunities made available by the \$1.6 billion Third Frontier Project first launched in 2002. The project was renewed in 2010 with an additional \$700.0 million, extending its impact through 2016. So far nearly 50.0 percent of the allotted funds are accelerating life sciences initiatives.

Life sciences continues to be a bright spot among the state's industry sectors, due to employment growth and modest venture capital funding funneling into the state.



Valtronic's new U.S. headquarters in Solon, outside of Cleveland.

ALLTECH MEDICAL

expanded at the end of 2011 from 13,500 s.f. at 6551-6571 Cochran Road into 50,000 s.f. at 28900 Fountain Parkway in Solon, outside of Cleveland.

VALTRONIC TECHNOLOGIES

purchased 29200 Fountain Parkway, a 60,000 s.f. facility in Solon, for its new U.S. headquarters. The \$4.3M investment will allow for 50 new jobs.

QUANTUM HEALTH

expanded by 18,000 s.f. at 7450 Huntington Park Drive in Columbus for a total of 40,000 s.f. The company elected to remain and expand in Ohio, rather than moving to rumored Colorado or California, due to local incentives.

CHRIST HOSPITAL

announced a \$265.0M expansion in February 2012. Plans detail an expansion to the Mt. Auburn campus for a new orthopedic and spine research and clinical program center.

Although life sciences activity is scattered throughout the state of Ohio, a majority of industry representation and output comes out of the major cities of Cleveland, Columbus and Cincinnati.

Activity key:

Leasing

Development

Sales

Tenants in the market

Large blocks of space



Interest groups are working to develop Salt Lake City's research capacity in hopes of moving beyond its status as a go-to warehousing destination.

Global trends

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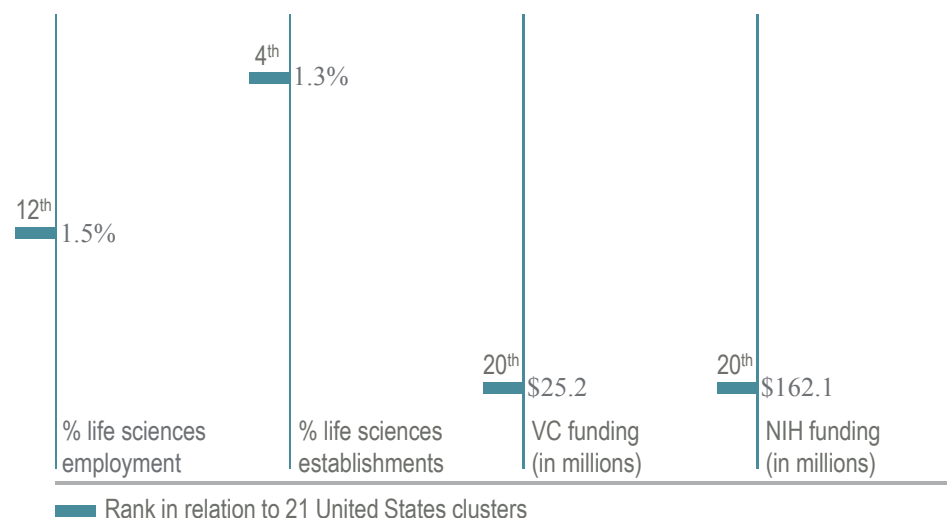
Salt Lake City market overview

The Salt Lake City life sciences cluster has grown out of its roots as a destination of choice for warehousing drugs and treatments. Currently Salt Lake City is home to only about 500 life sciences-related companies, but these account for a sizable 1.3 percent of the total workforce.

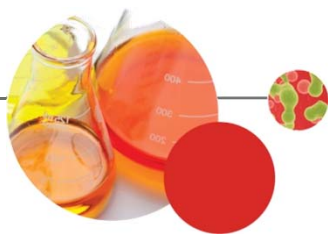
Several of these companies include headquarter operations for research and clinical testing companies Axial Biotech and ARUP Laboratories and biotech companies Myrexix, Amedica and Myriad Genetics. Multinational companies, such as Watson Pharmaceuticals and Cephalon, have sizable office and warehouse presences in Salt Lake City whereas Bard Access Systems, Q Therapeutics and Varian Medical Systems alone comprise over one million square feet of warehouse space.

Public and private groups are increasingly trying to build up Salt Lake City's potential as a research hub. In April 2012, the University of Utah opened its state-of-the-art USTAR building, a 208,000-square-foot, \$130.0 million lab, office and conferencing facility. This state-funded development was built to promote collaboration among the university's many scientists. Considering the cluster's relatively low venture capital and NIH funding receipts, public and private groups are hoping initiatives like the USTAR building will demonstrate the area's capacity as a research hub and draw more funds to the area.

Salt Lake City life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health



16

Although Dallas is still emerging as a life sciences cluster, it has already achieved a sizable corporate presence with over 1,000 companies located in the area.

Global trends

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Dallas / Fort Worth market overview

The Dallas/Fort Worth market has more than 1,000 companies employing over 25,000 employees in the life sciences industry. The largest segments are the pharmaceutical and medical equipment sectors of the industry, which make up roughly 44.0 percent of the existing local industry.

The highest concentration of life sciences companies is along the I-75 corridor from Richardson in the north and south to Northwest Highway; there are also pockets in the medical district along Stemmons Freeway, in Fort Worth, and in the Mid-cities at Airport Freeway and Loop 820.

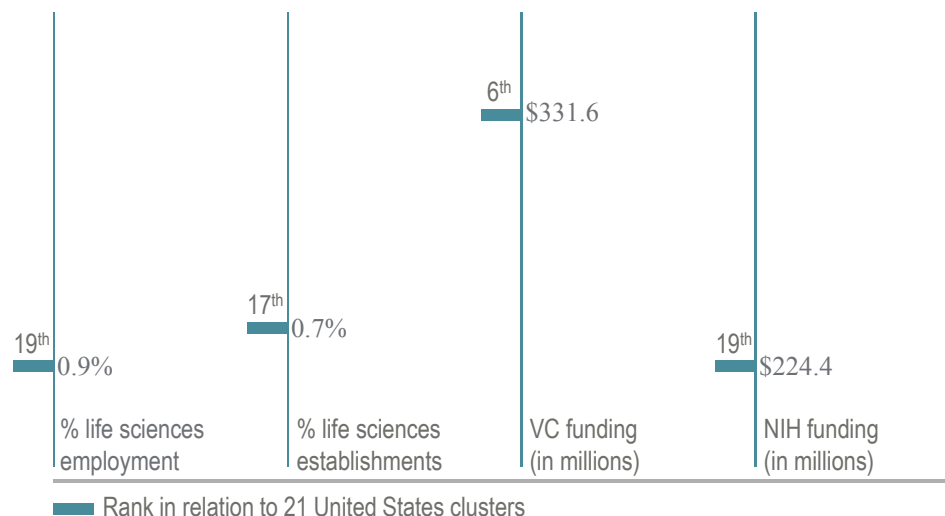
In addition to the established companies, there are over a dozen incubator locations. BioCenter, a 100,000-square-foot, state-of-the-art life science facility in the Stemmons Freeway medical district, is just one example of such incubators. The property was completed in 2009 and is currently 48.0 percent occupied. The property was developed to allow complete customization opportunities for incubator firms looking for fully equipped laboratories and preferential access to the UT Southwestern Medical Centers' Scientific Core.

UT Southwestern, which is highly regarded for its Medical Laboratory Science degree program, along with several other local college and universities offer a broad range of degree programs, which help to fuel the local employment base for the industry. Similar to other emerging clusters, Dallas's relatively low cost of doing business compared to coastal clusters add to Dallas / Fort Worth's attractiveness.

Outlook

The state of Texas has made a concerted effort to grow the life sciences industry by forming the Texas Life Science Center for Innovation and Commercialization (TLSCIC) in conjunction with Texas Emerging Technology Fund (ETF). Emerging life sciences companies can take advantage of the TLSC's resources as they work toward moving products through the development process.

Dallas / Fort Worth life sciences scorecard





Wisconsin's rapidly growing biotech sector ranks among top 10 nationwide for employment growth.



Global trends

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Southern Wisconsin market overview

The Southern Wisconsin life sciences cluster benefits from its central location between the nearby Midwestern hubs of Minneapolis and Chicago, with a large amount of activity occurring around the larger cities of Madison and Milwaukee. With roughly 550 companies, employing over 12,000

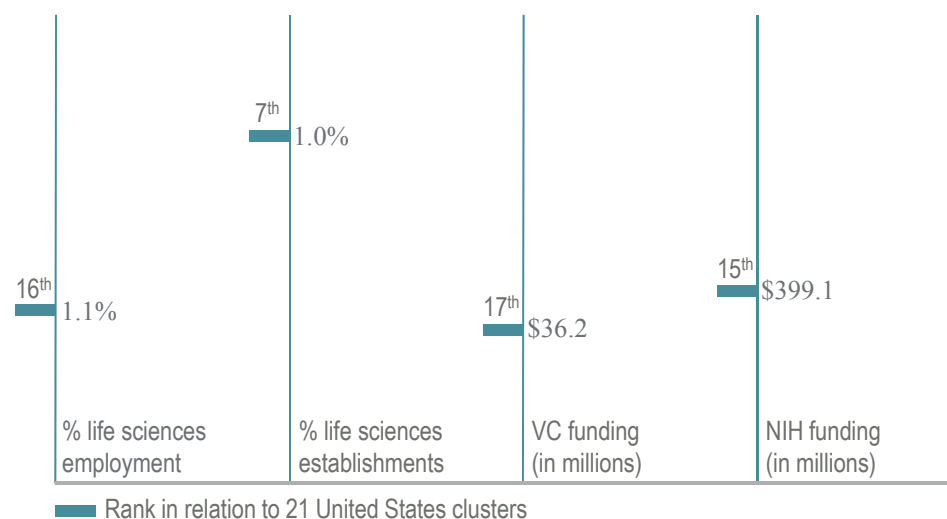
individuals in the southern half of the state, it's clear that Wisconsin's life sciences industry is a growing and important part of the local economy. In fact, according to the Wisconsin Technology Council, Wisconsin recently ranked among the top 10 states for biotechnology employment growth.

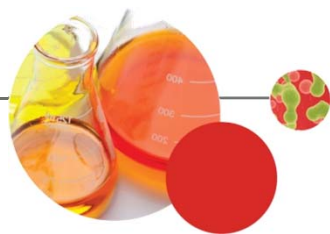
From a funding perspective, Southern Wisconsin struggles to compete with other Midwestern life sciences hubs. However, in 2011, the state introduced two venture capital funds totaling \$400.0 million controlled by the newly minted Wisconsin Venture Capital Authority, a move that will likely improve funding levels for life sciences start-ups.

Recently, GE Healthcare, based in Wisconsin, received \$12.0 million in investments from parent company General Electric to bolster its already strong medical device business. TomoTherapy, a large medical device company based out of Madison, was acquired by California-based Accuray in mid-2011. Accuray has so far maintained TomoTherapy's presence in Madison, including manufacturing functions.

The Southern Wisconsin cluster will see its life sciences industry mature, due in large part to a growing biotechnology sector, mature presence from medical device and instrument manufacturers and focus from local economic development groups.

Southern Wisconsin life sciences scorecard





18

Florida is rapidly becoming a major life sciences hub.

Global trends

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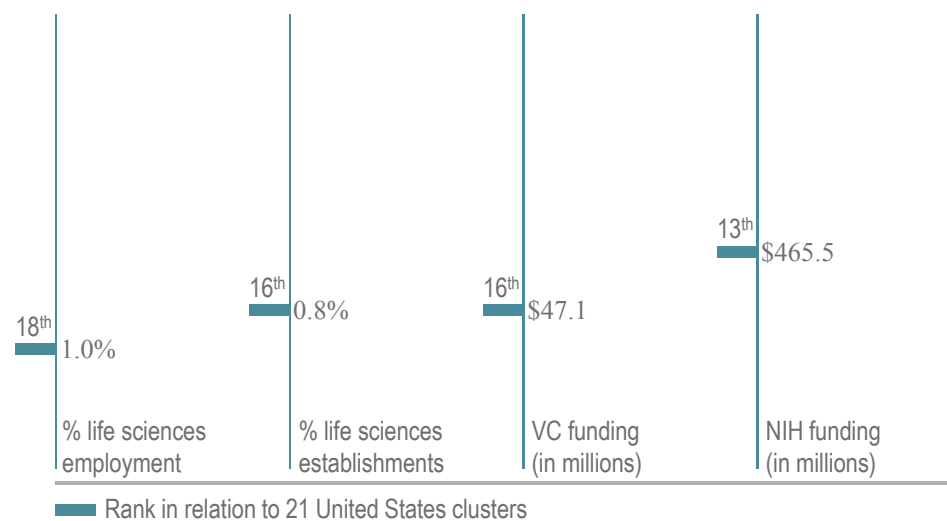
Central & Southern Florida market overview

With the second fastest growing market for life sciences in the country, Florida is rapidly expanding its presence as a life science hub. Moreover, the state is developing a singular market for life sciences with specific hubs emerging throughout the state. For example, research and development

is focused in Central and South Florida. Moreover, in Central Florida research and development is focused on Orlando's Lake Nona Medical City and Florida Hospital Health Village as well as in the area around the University of Florida. Meanwhile, South Florida's research and development community is fixed in Jupiter and Port St. Lucie as well as around the University of Miami's Jackson Memorial Hospital. Tampa Bay is serving as a hub for biotechnology and pharmaceuticals and Northeastern Florida is witnessing the emergence of a medical device cluster.

Although Florida has made large strides in developing its life sciences industry, the industry remains in its early stages, especially when compared to the larger life science hubs. The state still must work to attract venture capital, promote technology transfer and foster a strong start-up environment. Even though these steps still must be taken, we are optimistic that Florida will be a strong player in the life sciences. The state is aggressively pursuing research institutes and luring them into the state with incentives. This should have the desired result of creating spin-off companies that will demand office and lab space. Additionally the state is using its competitive advantages to carve out a life sciences niche. Orlando is already known as a world class site for simulation technology, thus the metropolitan area is leveraging this into the world of medical simulation technology and the opening of USF's CAMLS facility is a major example of this. Florida is also attempting to leverage its strong tourism infrastructure into a medical tourism industry. Therefore, we believe that Florida can leverage its unique advantages to create niche roles in the life science industry that rival locations and metro areas cannot offer.

Central & Southern Florida life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

Central & South Florida life sciences statistics

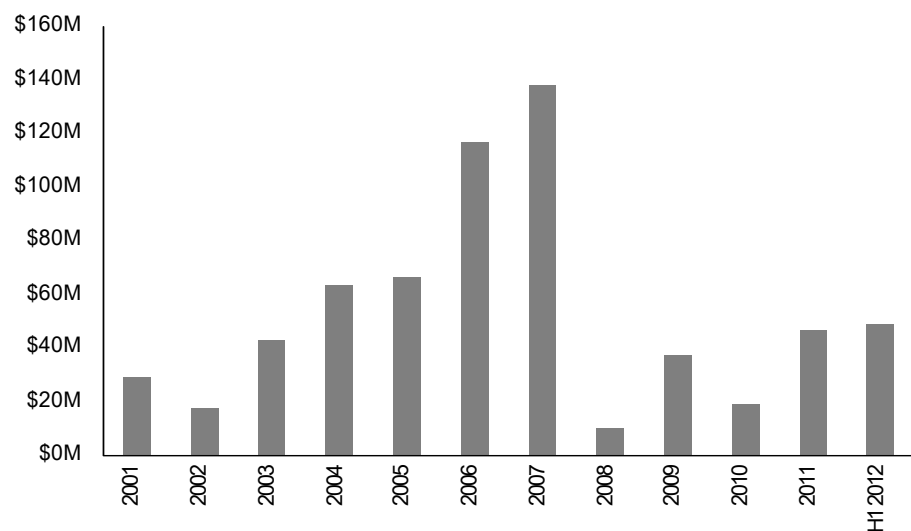
Major life sciences research parks

Park name	Acres / entitlements	Existing RBA	Vacancy
Lake Nona Medical City	650 acres / 7M s.f.	468,000 s.f.	0.0%
Progress Corporate Park	204 acres / 180,000 s.f.	550,000 s.f.	3.6%
USF Research Park	112 acres / 535,000 s.f.	428,569 s.f.	2.0%
Tradition Center for Innovation	120 acres / 410,000 s.f.	207,000 s.f.	0.0%
Research Park at FAU	94 acres / 535,000 s.f.	345,786 s.f.	26.1%
Exploration Park at Kennedy Space Center	400 acres / 450,000 s.f.	73,000 s.f.	N / A
UM Life Science & Technology Park	10 acres / 1.8M s.f.	252,079 s.f.	38.4%
Treasure Coast Research Park	1,634 acres / 1.3M s.f.	293,815 s.f.	0.0%

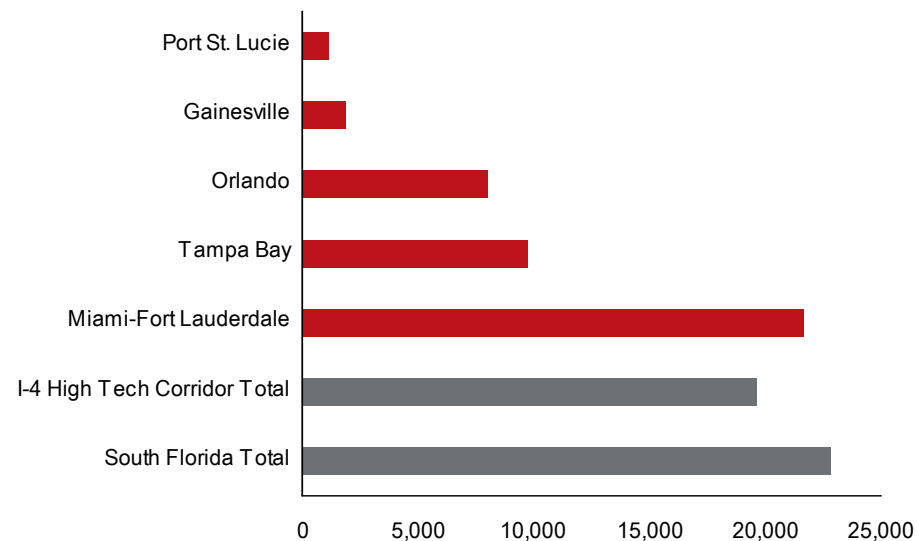
Major life sciences research institutes

Institute	Location	Size
The Scripps Research Institute	Jupiter	348,000 s.f.
Harbor Branch Oceanographic Institute	Fort Pierce	317,509 s.f.
H. Lee Moffitt Cancer Center & Research Institute	Tampa	190,000 s.f.
Sanford-Burnham Medical Research Institute	Orlando	170,000 s.f.
USDA Horticultural Research Laboratory	Fort Pierce	170,000 s.f.
Oregon Health & Science University Vaccine and Gene Therapy Institute	Port St. Lucie	130,000 s.f.
Torrey Pines Institute for Molecular Studies	Port St. Lucie	103,000 s.f.
Max Planck Florida Institute	Jupiter	100,000 s.f.
UF Institute of Food and Agricultural Sciences	Fort Pierce	90,000 s.f.

Venture capital funding



Employment



I-4 High Tech Corridor

Overview

The I-4 High Tech Corridor extends across 23 counties but is anchored at three of Florida's leading research universities: The University of Florida, the University of South Florida and the University of Central Florida. These three research universities, which collectively spent nearly \$1.2 billion in research in 2012, are home to six of the state's seven life sciences centers of excellence and the state's two largest biotechnology incubators: the Sid Martin Biotechnology Incubator and the USF Technology Incubator.

Collectively, the areas surrounding these three universities are home to 100 biotechnology companies and a total of 1,280 life science companies, employing nearly 20,000 people. Several of the state's largest research institutes are based in the area including the H. Lee Moffitt Cancer Center and Research Institute, the Sanford-Burnham Institute, the McKnight Brain Institute and the UF/Shands Research Institute.

Outlook

Florida is a growing market for the life sciences and has made impressive progress over the past decade. Future development seems destined to be centered along the I-4 High Corridor, and most likely in the area surrounding Orlando. Orlando is home to two large life sciences projects, the Lake Nona Medical City and the Florida Health Village. The Lake Nona Medical City alone is expected to employ over 30,000 life sciences professionals and generate an annual economic impact of \$7.6 billion by 2017. The Lake Nona Medical City, located just south of Orlando International Airport, is a total of 650 acres with more than 7.0 million square feet of entitlements. Currently, 2.5 million square feet have or are being developed, totaling \$1.3 billion. Among these, 468,000 square feet are for three research facilities: the 198,000-square-foot Burnett Biomedical Sciences Building, which is home to the 30,000-square-foot MD Anderson Cancer Center; Sanford-Burnham Medical Research Institute's 170,000-square-foot facility; and UF/Shands Research Institute which will be 100,000 square feet when completed at the end of 2012. Other life science-related tenants include UCF's College of Medicine, Nemours Children's Hospital and the Orlando VA Medical Center. Additionally, Orlando's Florida Health Village is slated to be another life sciences center. Windsor Healthcare Equities is planning to build a 156,000-square-foot Bioscience Building, which already has secured a 62,400-square-foot lease from the Profil Institute for Clinical Research, which will bring 75 jobs to Orlando.



The Sanford-Burnham Institute

2 RECENT DEALS

The Profil Institute for Clinical Research leased 62,400 s.f. at the Florida Health Village Bioscience Building. Lake Nona Medical City Incubator will lease 20,000 s.f. at the Life Sciences Innovation Center.

CURRENT PROJECTS

H. Lee Moffitt Cancer Center is building a 150,000 s.f. research facility at its McKinley Campus and Univ. of Florida / Shands will open its 100,000 s.f. Life Sciences Innovation Center.

PROPOSED PROJECTS

Windsor Healthcare Equities will build a \$55M, 156,000 s.f. project called the Florida Health Village Bioscience Building and the Orlando Immunology Center will build a 18,600 s.f. clinic and research center.

COMPLETED DEVELOPMENT

USF opened its 90,000 s.f. Center for Advanced Medical Learning and Simulation (CAMS).

Florida is a growing market for the life sciences; Orlando, Lake Nona in particular, is likely to be the epicenter for growth.

Activity key:

Leasing

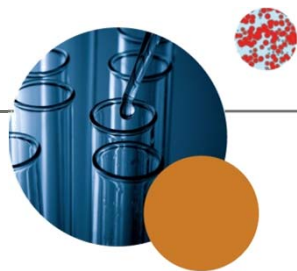
Development

Sales

Tenants in the market

Large blocks of space

South Florida



Overview

South Florida is emerging as a life sciences hub within the state, partially driven by intense economic development efforts by state and local governments. The arrival of Scripps Florida in 2009 and the completion of the adjacent Max Planck Florida Institute earlier this year have increased South Florida's profile among the life sciences community. The 345,000-square-foot Scripps Florida Research Institute, which received \$94.0 million from Palm Beach County in addition to the one-time investment of \$310.0 million awarded by the state, opened with a focus on neuroscience, medicinal chemistry and biotechnology, among other fields. Currently, the facility employs 430 people and that number is expected to grow to 550 by 2014. Over the last three years, the Institute has filed over 65 patents and Scripps Florida technology has been licensed 26 times since its creation. Max Planck Florida, which opened its doors earlier this year, is located adjacent to the Scripps facility. It is anticipated that the 100,000-square-foot facility (58,000 of which is laboratory space) will create 1,800 jobs and generate \$2.0 billion in economic activity over the next decade. Due to the institutes' success, Scripps Florida and Tenet Florida are collaborating to construct a 30-acre medical center on adjacent land reserved for life sciences / biotech expansions.

The state's vision of a life sciences cluster emerging as a result of its investment in Scripps Florida and Max Planck is beginning to come to fruition, as numerous companies have taken occupancy in close proximity to the Institute, and as many as 14 companies are currently considering relocating to the cluster. Although overall life science employment has not seen significant gains, companies such as Envoy Therapeutics, Dyadic, Somahlution and CHS Pharma have relocated to Jupiter to be near the Scripps and Max Planck.

The other major life sciences facility in South Florida is located at the University of Miami Life Science and Technology Park located in the Miami Health District, which is also home to Jackson Memorial Hospital facilities, the third largest teaching hospital in the United States. The Park is comprised of 252,000 square feet and houses wet and dry labs, offices and lab-ready development suites. Tenants at the facility, which is still expanding, include Advanced Pharma, Andago and the Right Space Innovation Center.

Outlook

South Florida is beginning to emerge as a stronghold for life sciences; however, the impact on commercial real estate (particularly office space) has been minimal. With most activity taking place in newly constructed university complexes and other nonprofit institutes, significant expansion of lab space and other life sciences office space has yet to materialize, but progress is indeed being made. Local economic development agencies have demonstrated a commitment to expanding the burgeoning life sciences clusters throughout South Florida, and concurrent with highly publicized research achievements and increased federal and grant funding, South Florida is quickly becoming a recognized, viable option as a potential location for life sciences companies.



The recently completed Max Planck Institute's 100,000-square-foot, state-of-the-art facility in Jupiter, FL. Not only is the facility LEED-NC accredited, but it also complies with the Lab 21 environmental performance criteria outlined by the U.S. Department of Energy.

RIGHT SPACE INNOVATION CENTER
signed a lease for 24,600 s.f. at the UM Life Science and Technology Park. The shared lab/office space is one of only such four spaces in the nation and the first of its kind in the Southeast United States.

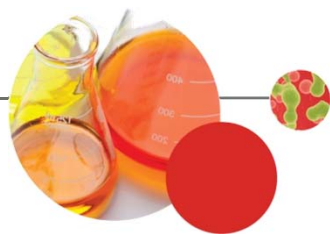
UMLSTP
A hospital will be built adjacent to the Scripps Institute in Jupiter. Plans include four more buildings to house lab / office space and retail, totaling 2M s.f.. The plans are flexible and will be implemented upon demand.

DR VITHALBAI DHADUK
The neurologist who helped found Somahlution, purchased a 31,000 s.f. building in Jupiter to house the company, as well as Global Pharma Analytics. The building is comprised of 60 percent lab space.

ONEBLOOD, INC.
purchased 3000 W. Cypress Creek Road to house operations. The 75,000 s.f. building sold for \$9.8 million, or \$131 p.s.f. The transaction resolved a troubled situation.

South Florida's life sciences industry is clustered around university and institutional research campuses, but all signs point to steady expansion in the near future.

Activity key: **Leasing** **Development** **Sales** **Tenants in the market** **Large blocks of space**



19

Diversified industry presence and strong support from public-private partnerships continue to transform Indy's life sciences community.

Global trends

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Indianapolis market overview

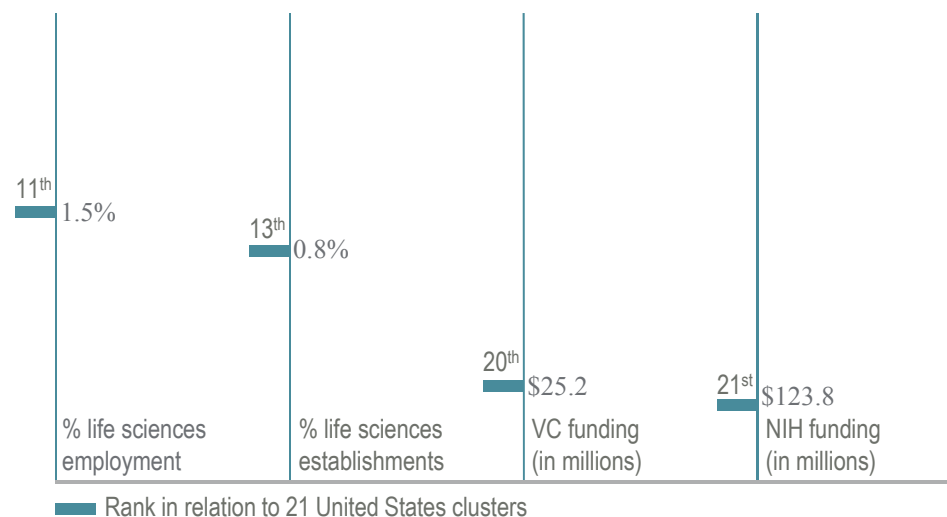
Indianapolis is home to a growing life sciences community founded on the presence of many large, pharmaceutical corporations. Most notably, Eli Lilly, Roche Diagnostics, Endocyte and DOW AgroSciences have their headquarter operations within the Central Business District. The broader

state of Indiana is also home to a multitude of industry companies, among them medical instrument and apparatus manufacturers Cook Incorporated of Bloomington and Zimmer, Biomet and Depuy Orthopaedics of Warsaw.

Indianapolis is comprised of about 350 life sciences establishments, employing roughly 12,600 people in the technical field. From a sheer size standpoint, Indianapolis does not have as many establishments or employees when compared to industry hubs like New Jersey / New York City and Boston, but interest groups in the state have been working to change that. Through the careful guidance of the area's leading public-private partnership, BioCrossroads, Indianapolis (and the state-at-large) has become a hotbed of activity for start-ups. According to the *Indianapolis Business Journal*, the partnership's efforts have helped launch 330 companies and attracted over \$330.0 million in venture capital since its creation 10 years ago.

Leaders at BioCrossroads have also leveraged cross-regional partnership with fellow start-up clusters like San Diego and the Research Triangle Region. Due to their careful fostering and partnering models, the cluster has become one of the more successful areas in turning out new biotech companies and innovations.

Indianapolis life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health



A budding location for industry start-ups, supported by funding opportunities made available through economic development groups.

Global trends

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Southern Michigan market overview

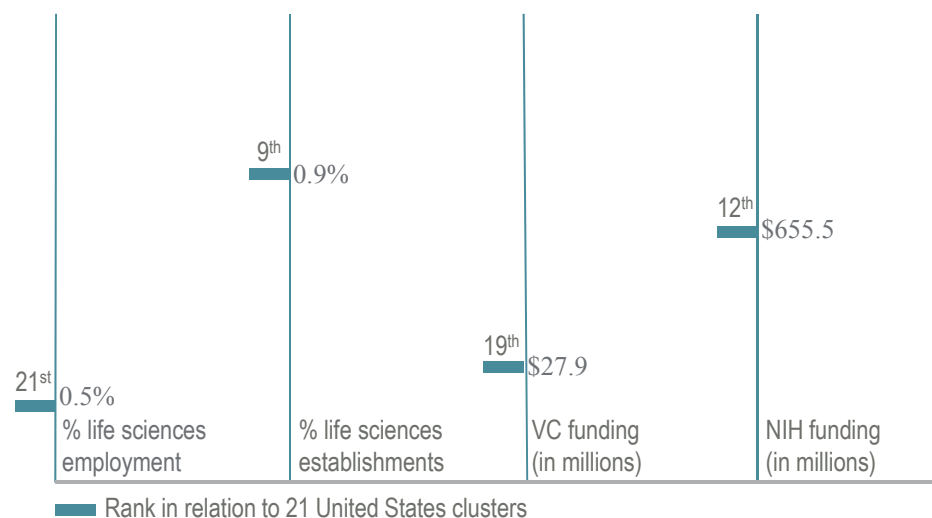
Life sciences activity in Michigan is largely concentrated in the metropolitan areas of Detroit, Grand Rapids, Lansing and Ann Arbor in the southern-half of the state, largely due to proximity to major research universities and the presence of economic development groups focused on the industry.

There are over 1,000 life sciences establishments in the area, employing roughly 12,500 people. A large amount of life sciences research originates in area universities – either among graduate students or via start-ups that spin-out once the scientists graduate.

Economic development and industry-minded groups really help to propel activity within Michigan, such as the Michigan Economic Development Corporation (MEDC), including the Michigan Strategic Fund and Ann Arbor SPARK. The Michigan Life Science and Innovation Center near Ann Arbor, a 57,000-square-foot incubator, is a venture of MEDC and Ann Arbor SPARK (among other private and public groups). Recently the center received \$5.0 million in funding from the Strategic Fund to build a new lab; the biosciences division of SRI International, a R&D nonprofit, will be the first occupant in the new lab. Another company who recently chose a Michigan address due to incentive offerings from MEDC is ArticAx, a start-up focused on macular degeneration research. It announced plans to open a 7,500 to 10,000-square-foot lab in Grand Rapids later this year.

Although the industry is still emerging in Michigan, the resources offered by groups like the MEDC should continue to garner interest among start-ups within Michigan's university system and from out-of-state.

Southern Michigan life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

21

The life sciences sector is emerging in Atlanta as an increasingly effective economic driver.



Global trends

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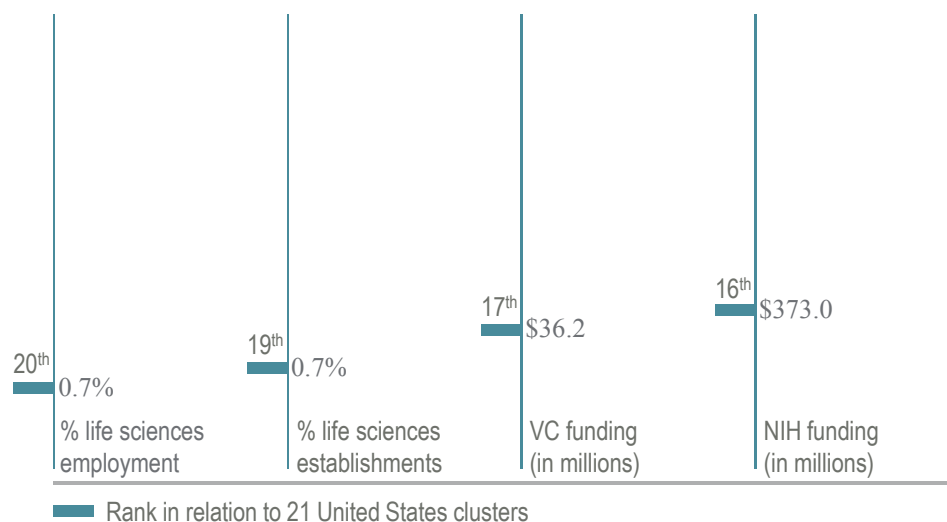
Atlanta market overview

The life sciences industry is emerging in Georgia as an increasingly effective economic driver. Several factors in play have converged to create the ideal environment for vibrant growth within this sector. Atlanta houses the Centers for Disease Control and Prevention (CDC) and there is a high

concentration of world class educational and research programs. The state is already home to more than 900 bioscience companies and lawmakers and economic developers continue to foster initiatives that ensure a favorable corporate climate. There are eight major academic institutions in the area that offer a range of bioscience-related degrees. Many of those schools benefit from fostering by the Georgia Research Alliance, an independent nonprofit that coordinates research efforts between the public and private sectors. Since 1990, a multitude of renowned scientists have been recruited to Atlanta through its Eminent Scholars program. Currently, the industry has an economic impact of \$23.0 billion annually for the state.

Recognizing the life sciences industry's positive influence, Georgia has embraced this sector and there are multiple programs in place to spur growth. Atlanta and its home state both enjoy a business-friendly reputation and life sciences companies have access to various incentives that include tax credits, sales tax exemptions, job training, cash grants and property tax relief. Specifically targeted to the industry are services provided by the Georgia Bioscience Commercialization Center, a resource hub that helps entrepreneurs create stronger infrastructure and bring technological innovation from bench to market. The Georgia Research Alliance launches companies around laboratory discoveries at partner universities through its VentureLab program. There is also the Georgia Medical Center Authority – established to advance the life sciences industry through the provision of research, development and manufacturing facilities and programs.

Atlanta life sciences scorecard



Sources: Bureau of Labor Statistics, PricewaterhouseCoopers, National Institute of Health

Midtown

Overview

The Georgia Institute of Technology (Georgia Tech) and its biomedical / bioengineering partnership with Emory University are critical drivers of life sciences activity in Midtown. Innovative and best-in-class research has shone the spotlight on the submarket as this industry cluster continues to grow. Tenants are located in traditional tower office space like at Gateway Development's Centergy One Tech Square building as well as in more affordable low-rise B space on the Westside.

Outlook

Life sciences demand is likely to continue to expand in tandem with the growth of Emory and Georgia Tech's joint initiatives. Emory University already has an unparalleled advanced proton therapy center planned for the area. Midtown is also home to the metro's largest concentration of Millennials, highly educated ones at that, from which bioscience firms can draw employees. These factors ensure that activity in this sector will remain a bright spot for the Midtown submarket.

Northlake

Overview

Northlake is a niche office submarket of just 11.0 million square feet that developed around the same time as the neighboring Northeast submarket. With both Emory University's and the CDC's main campuses located on the western edge of the submarket, much of the leasing activity is driven by the need for proximity to those institutions by occupiers in the life sciences industry and vendors to the CDC. Space in the low- to mid-rise buildings that are germane to the submarket is also more affordable than in similarly bioscience-dominant Midtown to the south.

Outlook

Although the CDC has recently given back large blocks of leased space in a consolidation to recently built government space on its main campus, the institute remains the largest influencer of life sciences demand in Northlake. Many of the tenants currently active in the market provide services to the CDC or rely on its research programs. Add to that the confluence of Emory's research platform and it is evident why Northlake should continue as a bioscience hub for Atlanta.

GALECTIN THERAPEUTICS

will move its headquarters and clinical development program from a Boston suburb to Norcross in early October at Northwoods Commons. Galectin specializes in fibrosis and cancer therapeutics.

BAXTER INTERNATIONAL

broke ground on a \$1.0 billion manufacturing facility for biological medical treatments near Covington in August.

EMORY UNIVERSITY

will soon begin construction on a \$200.0 million proton therapy center in Midtown for clinical trials and research.

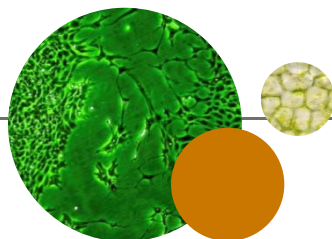
ETHICON

plans to invest \$185.0 million for capital improvements at its Cornelia facility. A Johnson & Johnson subsidiary, Ethicon produces the majority of the world's surgical suture supply. Ethicon will renovate and expand the facility by 100,000 s.f.

ELEKTA

will relocate its North American headquarters to 50,000 s.f. at The Terraces office complex in Central Perimeter. Based in Stockholm, Elekta develops medical devices and dose planning systems.

Georgia is home to more than 300 global life sciences firms clustered in a state that provides a healthy economic and logistical ecosystem for biotech growth.



Canada has proven to be a world-class contributor to the life sciences industry for many years.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Canada market overview

Canada's ability to compete on a global scale is largely driven by the success of a well-structured partnership between government, academic and healthcare institutions as well as the ability to retain a world-class work force. Life sciences-related companies contribute roughly CAD 85.0 billion (\$85.0 billion),¹ or more than 7.0 percent of Canada's GDP, and employ more than 400,000 nationally. Canada remains a bastion of stability. Although economic growth has not been buoyant, the economy has shown resilience to conditions abroad; real GDP hovering around 2.0 percent in the last two quarters as well as unemployment rates in the 7.0 to 7.5 percent range. Forecasts point to real GDP growth and stable unemployment levels over the next six to eight quarters.

Government spending continues to hold back growth as federal and provincial governments continue austerity measures to balance fiscal deficits. Notwithstanding, Canada remains the healthiest economy in the G7. Despite recent austerity measures the federal government announced, it will facilitate the biotech industry with CAD 400.0 million (\$400.0 million) to support the creation of a new, large-scale venture capital (VC) fund. In addition, the Industrial Research Program will be doubled to CAD 110.0 million (\$110.0 million)¹ annually.

¹ Six-month average conversion rate of 1.00 Canadian Dollar (CAD) per U.S. dollar, as of October 2012.

Industry statistics

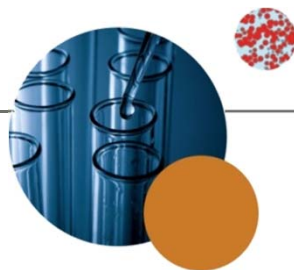
8.5 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students **21.1%**

1.9% Gross expenditure on R&D, as percent of GDP

Total patent applications, residents only **4,550**

Greater Toronto Area



Overview

The largest cluster of life sciences-related companies in Canada is found in the Greater Toronto Area where upward of 650 companies are located, including: nearly 300 pharmaceutical, medicine and device manufacturers; 167 R&D and testing laboratories; and more than 250 medical equipment and supplies related companies. These firms occupy nearly 30.0 million square feet of space and employ more than 87,000 people in the Greater Toronto Area.

At the heart of Toronto lies the Discovery District, Canada's largest concentration of research institutes, business incubators and business support staff. More than CAD 1.0 billion (\$1.0 billion)¹ is directed annually to research activities in this 617.0-acre research park holding 7.0 million square feet of facilities. The newest addition to this cluster is the research incubator MaRS Centre. A 750,000-square-foot facility dedicated to the development and commercialization of innovative technologies. An expansion of this building is currently underway, adding an additional 780,000 square feet of research and office space to the downtown market. MaRS, however, is only one of the many investments made over the past two years, totaling more than CAD 1.2 billion (\$1.2 billion).¹

Toronto is also the home to several large universities such as University of Toronto, York University and Ryerson University all with close ties to the life sciences industry. The University of Toronto, located in the Discovery District, is Canada's largest university housing over 70,000 students, 43.0 percent of which are enrolled in disciplines falling under the Faculty of Medicine.

Outside of the Discovery District, Toronto life sciences companies cluster around Meadowvale, Mississauga. The area is commonly known as "Pill Hill" because of its high density of pharmaceutical companies, including headquarter operations for GlaxoSmithKline and AstraZeneca.

Outlook

Investment capital that can translate research into commercial opportunities and outcomes continues to be the biggest hurdle for life sciences companies in Canada. In an effort to meet industry needs, both federal and provincial financial incentives are available, such as the Scientific Research and Experimental Development (SR&ED) program giving a tax credit of 35.0 percent up to the first CAD 3.0 million (\$3.0 million)¹ of qualified expenditures for SR&ED carried out in Canada. The Ontario Business-Research Institute Tax Credit is a 20.0 percent refundable tax credit program and the Ontario Innovation Demonstration Fund provides up to CAD 4.0 million (\$4.0 million)¹ in grants to early-stage companies. Also available is the Imagination, Manufacturing, Innovation, Technology (IMIT) grant which supports new building construction and/or building expansion in targeted sectors.

¹ Six-month average conversion rate of 1.00 Canadian Dollar (CAD) per U.S. dollar, as of October 2012.



Construction progress of the SickKid Research & Learning Tower, January 2012

HOFFMANN-LA ROCHE

The Swiss-based pharmaceutical company signed a 15-year, 175,000 s.f. lease at 7070 Mississauga Road in Mississauga, ON.

THE HOSPITAL FOR SICK CHILDREN

has invested more than \$400.0 million in a 21-story research tower in the Discovery District, projected to be completed by 2013. The facility will house more than 2,000 scientists and staff.

NORTHWEST HEALTHCARE PROPERTIES REIT

The Canadian-based REIT recently announced the acquisition of 807 Broadview Avenue, Toronto. The 45,770 s.f. building is 100% leased by Albany Medical Clinic.

LUMINEX CORPORATION

is on the market for a renewal of its existing 27,000 s.f. office / laboratory space in downtown Toronto or relocation options.

Investment capital that can translate research into commercial opportunities and outcomes continues to be the biggest hurdle for life sciences companies in Canada.

Activity key:

Leasing

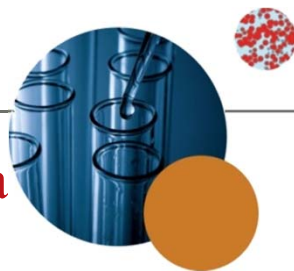
Development

Sales

Tenants in the market

Large blocks of space

Greater Montréal Area



Overview

The Greater Montréal Area (GMA) holds one of the largest life sciences clusters in Canada, consisting mostly of medical and pharmaceutical research, biotechnology, brand name drug manufacturing, and medical device and equipment manufacturing. The cluster is made up of approximately 620 organizations, 43,000 employees and approximately 16.6 million square feet of office, industrial and lab space. With over 80 multinational pharmaceutical companies and several Canadian headquarters, including Merck, Pfizer, Sanofi-Aventis, Valeant Pharmaceuticals and Bristol-Myers Squibb to name a few, the GMA is a major pharmaceutical center of Canada.

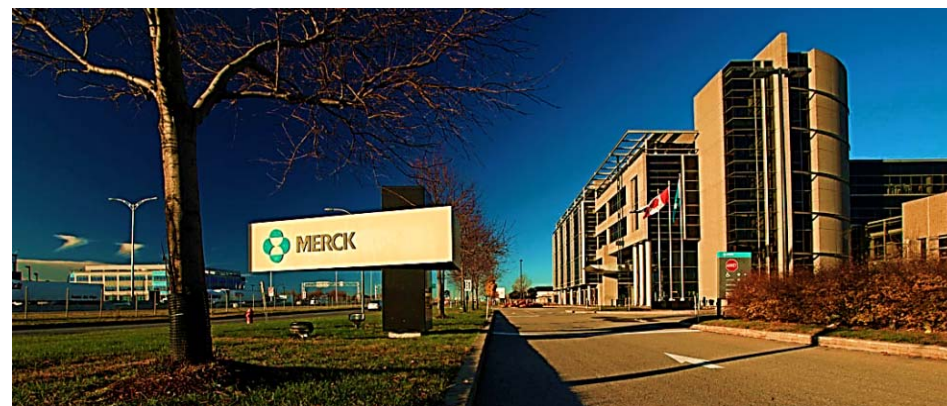
Montréal ranks second among North American cities for the number of post-secondary students per capita and has 11 post-secondary institutions devoted to the life sciences sector. With many students choosing to live and work in the city after graduation, Montréal acts as a global anchor for the industry, and an incubator for talent within Canada.

Recently, Montréal's Life Sciences sector suffered significant losses as major players such as Merck and AstraZeneca shut down their R&D facilities. In contrast, Valeant Pharmaceuticals announced that it would be relocating its head office from Mississauga, Ontario, to the Montréal suburb of Laval. With 117,000 square feet currently under construction to accommodate head office expansions, it is clear that the life sciences are holding strong in the GMA.

Outlook

The GMA life sciences sector is expected to realize pressure seen elsewhere across the globe with a strong push towards "rightsizing." This "rightsizing" has already translated into the closure of several large scale research facilities and significant job losses.

On the other hand, market conditions remain strong for the manufacturing and distribution sectors which have the potential to make up for the job losses in the R&D sector. Both the federal and Québec governments will continue to offer competitive incentives for life sciences companies looking to set up shop in the province and with over 40 companies providing venture capital for life sciences start-ups, the industry is not likely to suffer from lack of investment or incentives any time soon.



Merck campus for sale

VALEANT PHARMACEUTICAL
bought Sanofi-Aventis's 222,533 s.f. head office in Laval. The building sold for \$29.5M, or \$132.57 p.s.f. Sanofi will be vacating the premises once its new headquarters is complete.

COVIDIEN
signed a 5-year, 102,157 s.f. lease at 18101 Transcanada Highway, a single tenant industrial building in Kirkland. The building is undergoing major renovation to accommodate the needs of Covidien.

SANOFI-AVENTIS
After having sold their head office to Valeant Pharmaceuticals, Sanofi-Aventis is building a new, LEED-certified 66,000 s.f. head office in Laval's Biotech City.

MERCK FOR SALE
Situated on 53.8 acres with approximately 300,000 s.f. of Class A and B office space and a total of 414,000 s.f. of R&D, manufacturing, packaging and distribution space.

Montréal acts as a global anchor for the industry, and an incubator for talent within Canada.

Activity key:

Leasing

Development

Sales

Tenants in the market

Large blocks of space

¹ Six-month average conversion rate of 1.00 Canadian Dollar (CAD) per U.S. dollar, as of October 2012.



While still in its budding stages, Brazil's life sciences economy is well diversified, with ample focus on human health, animal health and agricultural biotechnology.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

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Brazil market overview

Brazil has enjoyed one of the fastest growing economies over the past few decades and continues its upward momentum as a leading South American economy. Advancements to its national healthcare system and growth in generic pharmaceutical manufacturing, agribusiness and biofuel research lay the ground work for Brazil's rapidly growing life sciences industry. International companies make up a majority of the country's players, particularly through acquisitions of local firms and products. Pfizer, Amgen and Sanofi have all recently made headlines for their investments in Brazilian companies.

According to a recent report from Burrill & Company, Brazil's pharmaceutical industry was valued at BRL 46.3 billion (\$22.9 billion) in 2010. It is now the seventh largest in the world and is expected to grow at a rate of 12.0 percent per year. A rise in the country's middle class has led to increased spending on healthcare and a shift in the types of diseases and maladies plaguing the local population. Chronic diseases more common in affluent nations are beginning to affect Brazilians, and thus creating a demand for more specialized and costly drugs. The government hopes to reduce its dependence on drug imports and is improving the funding and intellectual property (IP) protection landscape to encourage domestic achievements in innovation.

¹ Six-month average conversion rate of 2.02 Brazilian Real (BRL) per U.S. dollar, as of October 2012.

Industry statistics

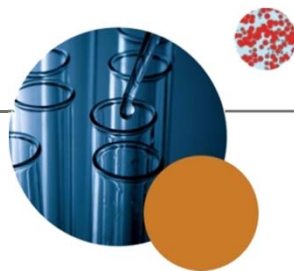
1.4 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students **12.2%**

1.2% Gross expenditure on R&D, as percent of GDP

Total patent applications, residents only **2,705**

Brazil



Overview

Over 75.0 percent of Brazil's life sciences companies are clustered among the three states of São Paulo, Minas Gerais and Rio de Janeiro, with 40.5 percent, 24.4 percent and 13.1 percent of companies in each state, respectively. The development of technological innovation is heavily linked to university research centers among these three states.

According to the Brazilian Association of Research Biotechnology, Brazil has around 237 national life sciences companies, most of which are small and have been active for less than 10 years. Half of these companies began operations inside university incubators and shared R&D centers whereas 20.0 percent of them are still in development phase and have not realized any revenue. Although 85.0 percent of these companies employ fewer than 50 employees, they all use a highly educated subset of the workforce, with 40.0 percent PhDs and 20.0 percent Masters of Science.

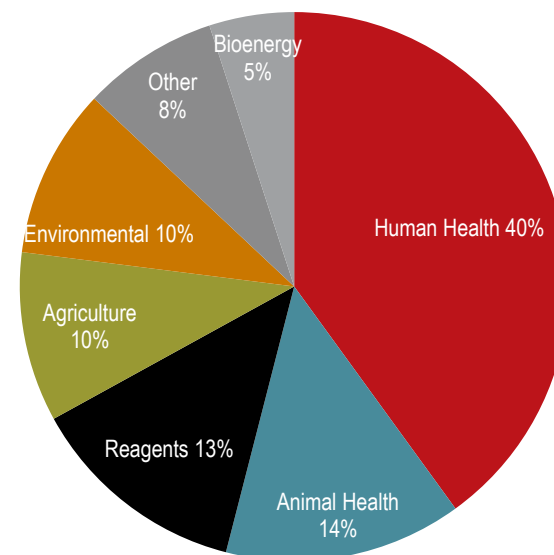
Over the past two decades, the Brazilian government has encouraged development of the nation's innovative industries. With the passage of the intellectual property laws in 1996, patents on pharmaceutical products were granted for first time, marking a major turning point. Since that time, the government has added protections for innovation. The Innovation Law of 2004 offers incentives for developing partnerships between private companies, research institutions and universities; incentives for universities and research institutions to participate in innovation; and incentives to promote innovation within private institutions. The Law of Goods offers private sector incentives to invest in R&D. Additionally, the government's industrial policy prioritizes the development of domestically owned, private pharmaceutical manufacturers. Most notably, the Profarma-Innovation program, operated by the government's development bank, Banco Nacional de Desenvolvimento Econômico e Social (BNDES), is investing about BRL 2.5 billion (\$1.24 billion)¹ in the industry through 2012.

Outlook

Regarding regional differences, the government has encouraged changes in the geographic distribution of graduate programs in order to strengthen the north, northeast and midwest. It also plans to invest in post-graduation programs, to further bolster the highly-educated Brazilian workforce.

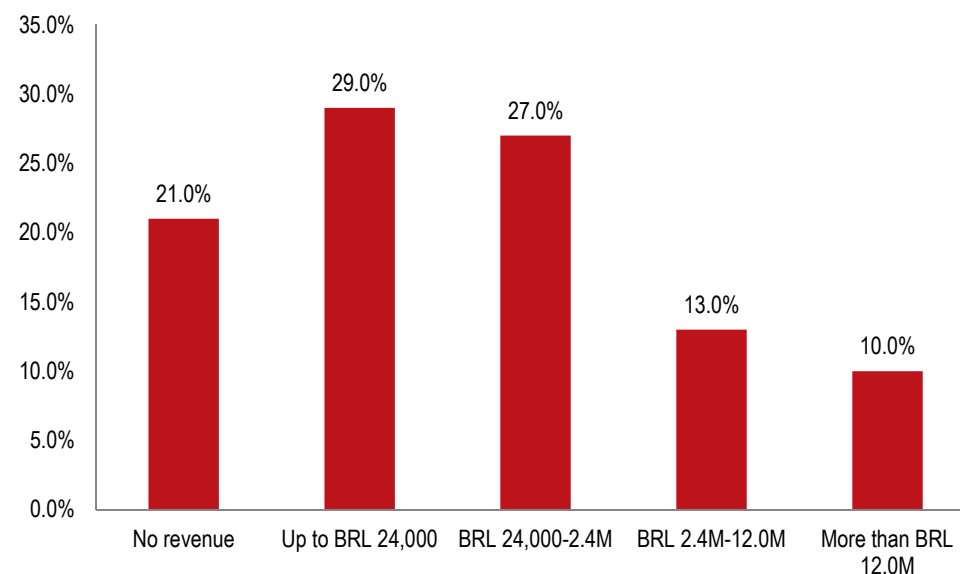
Only 1.2 percent of GDP, including public and private investment, was invested in R&D in 2009. According to the Ministry of Science, Technology and Innovation, 45.7 percent of this investment in R&D is done by companies. To compare, more highly technical and innovative countries typically benefit from 70.0 percent of private-funded R&D investment. Lack of seasoned industry professionals and R&D facilities combined with leery foreign and domestic investors will continue to challenge Brazil's development of a high-tech hub.

Brazilian life sciences companies by application



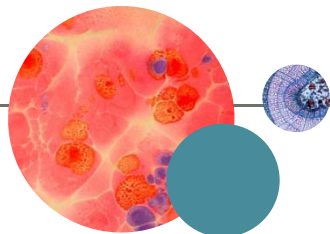
Source: BRBIOTEC & CEBRAP, 2011

Brazilian life sciences companies, percent by revenue¹



Source: BRBIOTEC & CEBRAP, 2011

¹ Six-month average conversion rate of 2.02 Brazilian Real (BRL) per U.S. dollar, as of October 2012.



Colombia's higher value-added sectors such as agro-industry, pharmaceuticals and mining are some of the key beneficiaries of recent trade liberalization policies.

Global trends

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Colombia market overview

With Latin America's fourth largest population and fifth largest economy, Colombia has been on the radar in recent years as one of the hottest emerging markets in the world. The Colombian economy has experienced considerable growth over the past decade, with national GDP more than double what it was just 10 years ago. The catalyst for this has been an aggressive campaign to strengthen national security, which has engendered confidence in the population and has opened the door for new investment opportunities. Traveling throughout the country is now much safer, and therefore, international commerce and tourism have benefitted immensely.

Another crucial factor in Colombia's growth has been its focus on trade liberalization, as it is committed to several bi- and multilateral agreements with the United States, the European Union,

Canada, Chile, Mexico, Peru, Brazil and Venezuela. Additional Free Trade Agreements are currently being negotiated with South Korea and Israel and should be implemented within the next two years. Higher value-added sectors such as agro-industry, pharmaceuticals and mining are some of the key beneficiaries of these agreements. A conscious effort is being made to reduce reliance on commodities, as past overexposure to external fluctuations in these markets has created significant turbulence.

Colombia's main export partners include the United States (32.0 percent), Venezuela (17.0 percent) and Netherlands (4.0 percent) while main import partners are the United States (28.0 percent), China (11.0 percent), Mexico (7.0 percent), Brazil (6.5 percent), France (4.5 percent) and Germany (4.0 percent). Exports have increased from COP 6.0 trillion (\$3.3 billion)¹ in 2010 to COP 8.9 trillion (\$4.9 billion)¹ in 2011 while imports have increased from COP 6.6 trillion (\$3.6 billion)¹ to COP 8.4 trillion (\$4.6 billion)¹ over the same time.

The largest cities are Bogotá, Medellín, Cali, Barranquilla, Cartagena and Bucaramanga. The majority of the population resides in the central mountains while the entire southeastern half remains largely underdeveloped and sparsely populated.

¹ Six-month average conversion rate of 1,824.00 Colombian Peso (COP) per U.S. dollar, as of October 2012.

Industry statistics

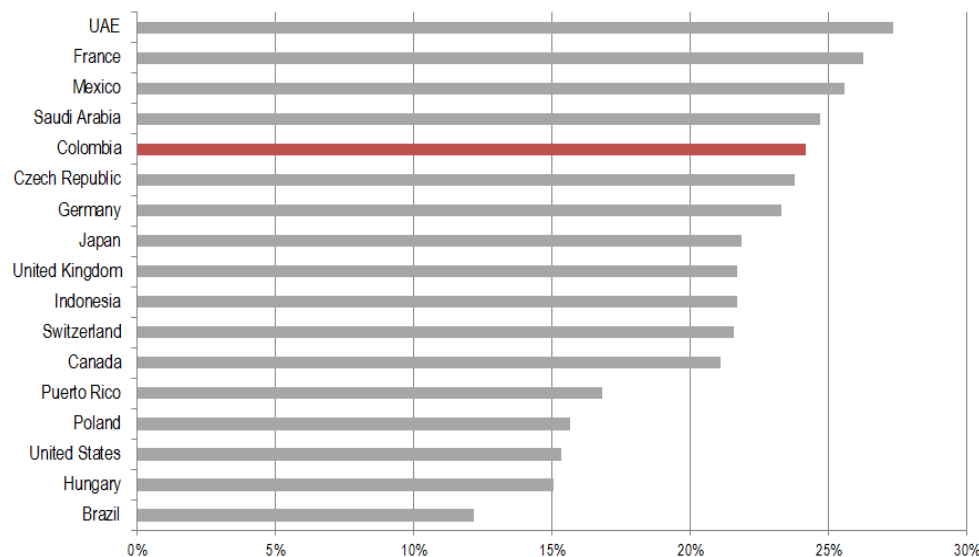
0.4 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students **24.2%**

0.2% Gross expenditure on R&D, as percent of GDP

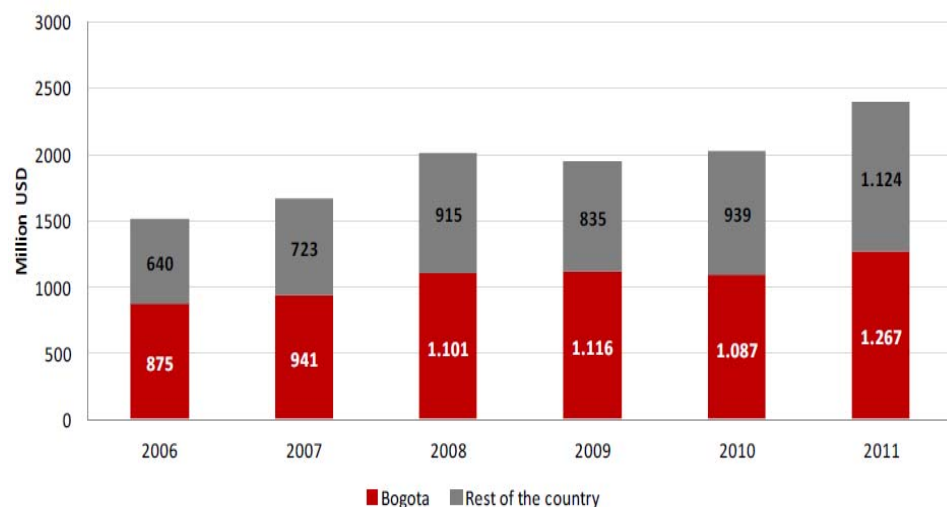
Total patent applications, residents only **133**

Graduate students in life sciences, as a % of total graduate students (2009)



Source: UNESCO

Pharmaceutical sales in Bogotá vs. Colombia



Source: Superintendencia de Sociedades (2011)

Bogotá market overview

Bogotá is the industrial, economic and cultural center of Colombia, accounting for approximately 25.0 percent of national GDP, annually. It is considered the fourth-most influential financial center in Latin America and also serves as a hub for the pharmaceuticals, textiles, publishing, construction and food production industries. Its relative proximity to the United States, Mexico and Brazil make it a convenient entry point into South America for many firms, which explains its growing attraction to multinationals. Its strategic location and growing industry are further illustrated by the fact that El Dorado International Airport is Latin America's busiest in terms of cargo traffic.

Colombian culture highly encourages scientific disciplines such as medicine and engineering; 24.2 percent of all graduate students are studying to go into a life sciences field, a statistic that ranks among the highest in the world. This is evident in Bogotá as its top universities (Universidad Nacional, Universidad Los Andes and Universidad Javeriana) are all committing increasingly larger investments in science faculty, facilities and science scholarships. As a result, Bogotá has become a leader in Latin America for these fields due not only to its immense and growing consumer market but also to a high availability of skilled labor. It is worth noting that other Colombian cities such as Medellín and Bucaramanga are attracting clusters of life science firms, although on a smaller scale.

Several pharmaceutical companies have established a regional headquarters in Bogotá in recent years. Colombia ranks as the fourth largest pharmaceutical consumer market in Latin America, and sales have been growing steadily since 2006. Pharmaceutical sales in Colombia approached COP 4.4 trillion (\$2.4 billion)¹ in 2011, over half of which were in the capital city. Approximately 24,000 people are employed in the industry in Colombia, with 55.0 percent based in Bogotá.

Bogotá is also home to several agro-industry firms, many of which have factories and logistics facilities in the western suburbs of the city such as Mosquera, Funza and Cota. The rapid industrialization of this sector has profoundly transformed these places from the quiet, flower-cultivating towns just 15 years ago to a hub of industrial activity comprising of over 5.0 million square meters of industrial floor area. These western suburbs are the new industrial center, not only of Bogotá, but of all Colombia, as there is an abundance of available land here able to accommodate large operations.

The key life sciences clusters in Bogotá apart from agro-industry are Chicó, Salitre and Puente Aranda. Chicó is a high-end office submarket where many tech-related firms have their headquarters. Salitre is a decentralized office submarket that has larger buildings with large floor plates, and is thus better able to accommodate larger multinational administrative operations. Puente Aranda, home to several multinational pharmaceutical manufacturing and laboratory operations, is the old industrial sector of Bogotá.

¹ Six-month average conversion rate of 1,824 Colombian Peso (COP) per U.S. dollar, as of October 2012.

Chicó

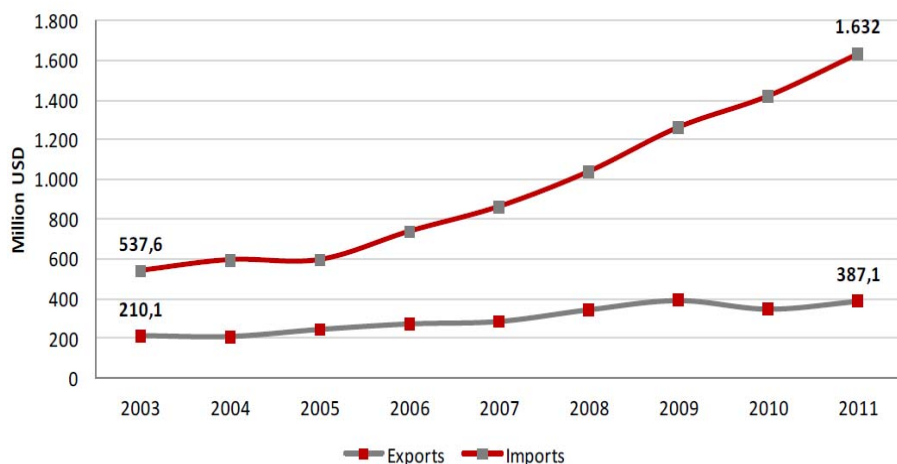
Overview

Chicó contains the largest quantity of corporate quality office stock in the city with over 400,000 square meters of built space. Many of the properties in the Chicó area are smaller, focusing on the local market and / or multinationals with smaller operations. However, many large buildings are located along Calle 100 (100th Street), one of the main thoroughfares and a business hub in the city. Several of the most influential pharmaceutical and tech companies are located here as it is the most expensive and in-demand place to work in the city. Among the firms with headquarters in Chicó are Merck Sharp & Dohme, Novartis, Sanofi, Clover and Abbott.

Outlook

At 8.1 percent, vacancy in this submarket is currently above the city average. However, vacancy for Class A space is around 5.5 percent while vacancy for AB offices is at 9.5 percent, illustrating the difficulty in finding larger spaces here. Consequently, rents have been climbing steadily for a few years and are now around COP 58,368.00 to 69,312.00 (\$32.00 to \$38.00)¹ per square meter for Class A and COP 51,072.00 to 58,368.00 (\$28.00 to \$32.00)¹ per square meter for Class AB space. This could be alleviated in the next two years as over 100,000 square meters of office space are expected to be delivered in the Chicó area by the end of 2014, although many of these projects are smaller buildings of 6,000 square meters or less.

Colombia Foreign Trade in Pharmaceuticals



Source: Asociación Nacional de Empresarios (2011)

Salitre

Overview

El Salitre is the city's newest office submarket. As the traditional business clusters of Bogotá have become built out with very few parcels available for new construction, Salitre has become the popular option for development as there is abundant land and it is conveniently located directly between downtown and El Dorado International Airport. The scale and quality of office development here can be attributed to the proximity of the international and domestic airports, coupled with large amounts of developable land. Salitre currently has approximately 245,000 square meters (16.0 percent of the total office stock). It will see the largest influx of future development, with another 150,000 square meters to be delivered by the end of 2014. Some large tech and pharmaceutical firms are beginning to locate here, as the abundance of available land facilitates larger and more efficient workplaces. Rents are also lower than offices in northern Bogotá, ranging from COP 54,720.00 to 60,192.00 (\$30.00 to \$33.00)¹ per square meter for Class A space and from COP 45,600.00 to 54,720.00 (\$25.00 to \$30.00)¹ per square meter for Class AB. GlaxoSmithKline, among others, has its headquarters and manufacturing facility along this corridor. Several pharmaceutical and agro-industry firms are renting or purchasing warehouse space in Salitre closer to the airport to use as a base for transporting goods to other parts of Colombia and beyond.

Outlook

Salitre has seen the most movement in the past few years, with over 58,000 square meters delivered and 60,000 square meters absorbed in the past year, thus keeping the vacancy rate somewhat low at 8.5 percent. The demand for space in Salitre is largely comprised of government agencies who are expanding and multinationals who benefit from proximity to El Dorado Airport. However, with over 150,000 square meters in planned construction here in the next two years, we are expecting an over supply of office space that should keep prices reasonably low in the near future compared with other parts of the city. A new office tower dedicated exclusively to the operations of life science firms, Torre Salud, is in the planning stages, although it is currently stalled.

¹ Six-month average conversion rate of 1,824 Colombian Peso (COP) per U.S. dollar, as of October 2012.

Western Suburbs (Cota, Funza, Mosquera)

Overview

Bogotá's western suburbs have been transformed in the past decade from quiet farms to large-scale industrial conglomerations. Several food manufacturing plants are located in these corridors. Agricultural warehousing space is also prevalent here, as goods coming from other parts of the country are stored before entering Bogotá, or vice versa. A few biotech firms looking for low-profile, low-rent warehouse space have also relocated here. These municipalities are offering very competitive incentives to lure production into their jurisdictions such as reductions in local commerce tax, payroll tax and property tax. There are also three Free Trade Zones either operating or in the planning stages that offer a reduction in corporate income tax from 33.0 percent to 15.0 percent, in addition to complete exemption of customs duties on equipment and merchandise sold.

Outlook

Industrial production in the western suburbs has been startling, with over 2.2 million square meters of industrial floor area having been constructed since 2009. This trend will continue through 2014 as several industrial parks and a handful of Free Trade Zones will be built and or expanded. However, this area is likely to be oversupplied thus keeping rents down. Life sciences companies looking to take advantage of newly implemented Free Trade Agreements should consider this area as a low-rent option with good access to El Dorado Airport as well as road transport to Medellin and the coffee region.

Latin America Cities of the Future		
Rank	City	Country
1	Santiago	Chile
2	Lima	Peru
3	Monterrey	Mexico
4	Bogota	Colombia
5	San Jose	Costa Rica
6	Guadalajara	Mexico
7	Queretaro	Mexico
8	Barranquilla	Colombia
9	Hermosillo	Mexico
10	Sao Paulo	Brazil

Source: FDI Magazine (2011)

Puente Aranda

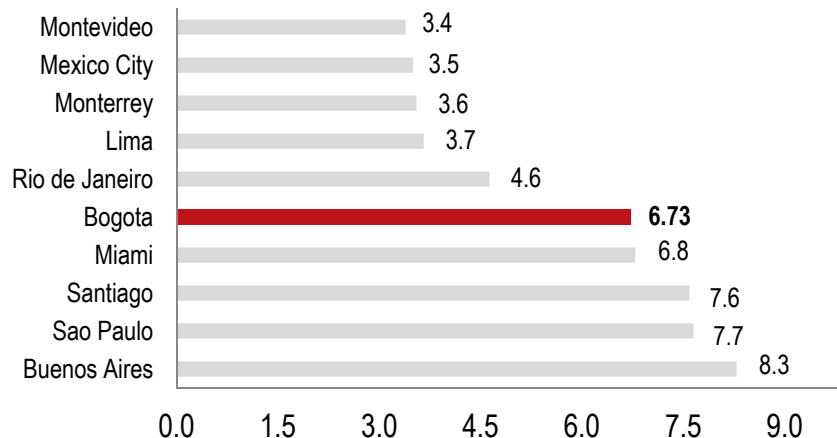
Overview

Puente Aranda is the oldest industrial sector of the city with stand-alone warehouses and factories dating back to the 1940s. The industrial supply here is primarily owner occupied factories and distribution centers with few modern, quality spaces. However, it is a hub of pharmaceutical production with several major players owning factories here: Boehringer Ingelheim, Bayer, Roche, Merck Sharp & Dohme, Biogen, Laboratorios California and Genfar. Most of these companies have been operating in Puente Aranda for several years, and are enjoying very low rents with a shorter commute.

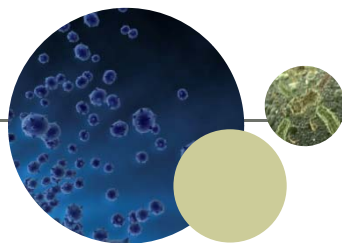
Outlook

Puente Aranda is the epicenter of Bogotá's urban redevelopment plans, and the municipality is taking active steps toward pushing industrial land use outside of the city while encouraging residential development in more centralized areas. Although land prices here are still among the cheapest in the city, the buildings are often outdated and in poor condition. This, coupled with the tax incentives that suburban municipalities are offering, is pushing many companies out of Puente Aranda and into the western suburbs. The pharmaceutical companies are less likely to relocate however, as they have much more invested in their buildings than most companies operating in Puente Aranda.

Best Latin American Cities for Innovation



Source: America Economia Magazine (2011)



Mexico is a leading country in the Americas with regard to life sciences product production and consumption, and ranks ninth worldwide.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Mexico market overview

The life sciences industry is currently estimated at MXN1.3 billion (\$96.0 million),¹ or 2.4 percent of GDP, according to the Mexican Association of Pharmaceutical Research Industries (AMIIF). According to PricewaterhouseCoopers, the industry market value is estimated to reach MXN 17.3 billion (\$1.3 billion)¹ by 2020. With growth projected upward of 12.0 percent, greater attention is being paid to regulation, safety and enhancements to the overall R&D and patent development processes. Mexico's geographic proximity to the United States is a major factor in its anticipated growth. Several multinational companies have already moved certain operations to the country and additional investments are expected.

Currently, about 200 companies have operations in Mexico, with the domestic production of drugs concentrated in Mexico City, State of Mexico, Puebla, Morelos and Jalisco states. According to KPMG's report on the local pharmaceutical industry, 85.0 percent of drug production occurs through

the subsidiaries of multinational firms, and even though local companies have made efforts to improve on R&D and innovation, many still lack the ability to produce their own medicines and therefore rely on the experience of large multinationals. As such, life sciences companies in Mexico are largely responsible for the manufacturing, distribution and exportation aspects of the value chain. Given the large manufacturing presence in the country, improvements to healthcare programs to increase public access to drugs and enhancements to IP protection and regulatory framework are top of mind to support both consumer and business growth in the coming years.

Outlook

One of the greatest threats to Mexico's growing life sciences industry is its rampant illegal market, currently estimated at MXN 1.3 billion (\$100.0 million)¹ annually by the Pharmaceutical Industry National Chamber (Canifarma). Canifarma continues to emphasize the need to combat smuggling, piracy and the gaps in IP protection, realizing progress on all factors are needed to maintain and encourage further investment by foreign companies.

¹ Six-month average conversion rate of 13.31 Mexican Pesos (MXN) per U.S. dollar, as of October 2012.

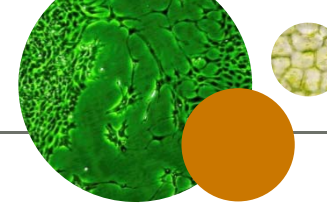
Industry statistics

1.0 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students **25.6%**

0.4% Gross expenditure on R&D, as percent of GDP

Total patent applications, residents only **951**



EMEA

A rich mixture of factors, including high-quality infrastructure, stability, a history of innovation, ease of doing business and some of the world's best educational establishments, continue to attract life sciences companies to Europe.

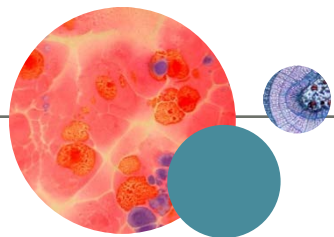
Like the United States and other mature life sciences markets, Europe is increasingly facing challenges to its primacy from emerging markets across the globe. But, despite the challenges and changing geographic scope of global life sciences companies, major established European clusters are sure to remain critical for the industry going forward.

The life sciences landscape in EMEA continues to undergo significant change, impacting heavily on the real estate strategies of life science companies. As portfolios and location strategies adapt to the new geographies of growth and emerging markets, rightsizing and disposal activity in mature markets has been a major driver of activity. Creative solutions are being sought and implemented for complex asset disposal, and partnering with real estate service providers to ensure optimal outcomes has become increasingly common. M&A and consolidation continue to drive churn and change in real estate strategy, often providing larger life sciences companies an opportunity to review and optimize global portfolio locations, functions and supply chains. A thorough analysis and understanding of the broader context for investment and relocation decisions is crucially important, with access to grants and incentives a key component of the decision-making process, alongside access to talent.

Identification of ways and means to remove excess cost from real estate remains high on the agenda for life sciences companies in Europe. Real estate strategies are increasingly being required to flex to suit financial and operating objectives. But this cost awareness is coupled with growing efforts to enhance productivity and efficiency in occupation, often through better space utilization. Among all of these real estate trends, continuing efforts to drive workplace change and transformation, throughout life sciences organizations and asset types, could be most challenging for the sector in 2013.



Established
France
Germany
Netherlands
Switzerland
United Kingdom



France is one of the leaders in the European life sciences industry, thanks in large part to the size of its market.

Global trends

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France market overview

France is first in Europe in terms of medicine production by volume and among the main global pharmaceutical exporters. The French life sciences industry produces yearly revenue of about EUR 47.0 billion (\$59.5 billion)¹ and reinvests more than EUR 1.0 billion (\$1.3 billion)¹ each year. The country is acknowledged for the quality of its research and for its history of therapeutic innovation and benefits from the best health system in the world, according to the OECD.

The biopharmaceutical sector in France employs more than 104,000 people. Education is also an important asset, with more than 18,000 new, highly qualified graduates produced by the French higher education system each year and bolstered by the presence of the national territory of renowned research institutions such as Inserm, CENR, CEA, Inra, Ifremer, IRD and the famous Pasteur and Curie Institutes.

The sector benefits from significant investment, with about EUR 4.9 billion (\$6.2 billion)¹ spent annually on R&D, according to 2008 figures. The industry can also count on a significant commitment from the French government. The Strategic Council for the Health industries, chaired by the president, includes government agencies and industry leaders to establish specific measures such as tax credits for research, more efficient clinical testing, or budgets that include funds to assist biotech companies.

In terms of geographical spread, the French landscape is clearly dominated by the Paris region, hosting almost all of the largest pharmaceutical headquarters, both French and international (only a few of them are settled in other regions, like Pierre Fabre in the southwest, or Merial in Lyon). Paris is also home to many high-level research institutes. As for pharmaceutical production, it is much more widely distributed: essentially in the Paris region, the centre of France (the "Pharma Valley") and the southeast (Rhône-Alpes). Lastly, several dedicated research centres focused on high-tech biology or new therapies have been created throughout France.

¹ Six-month average conversion rate of 0.79 Euros (EUR) per U.S. dollar, as of October 2012.

Industry statistics

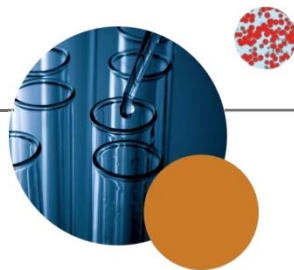
8.9 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students **26.2%**

2.3% Gross expenditure on R&D, as percent of GDP

Total patent applications, residents only **14,748**

The Paris Region



Overview

Paris and its suburbs are home to the highest concentration of pharmaceutical headquarters in France. The region benefits from its strategic location, highly educated population and rich concentration of prestigious hospitals and high-tech research capabilities.

Most of the laboratories are located in the first western inner suburb including Roche, Ipsen, Johnson & Johnson and Pierre Fabre at Boulogne; Servier at Suresnes; Bayer and Schering at Puteaux; and AstraZeneca and Bristol-Meyers Squibb at Rueil Malmaison. A few are located in the southern suburb, such as Sanofi at Gentilly.

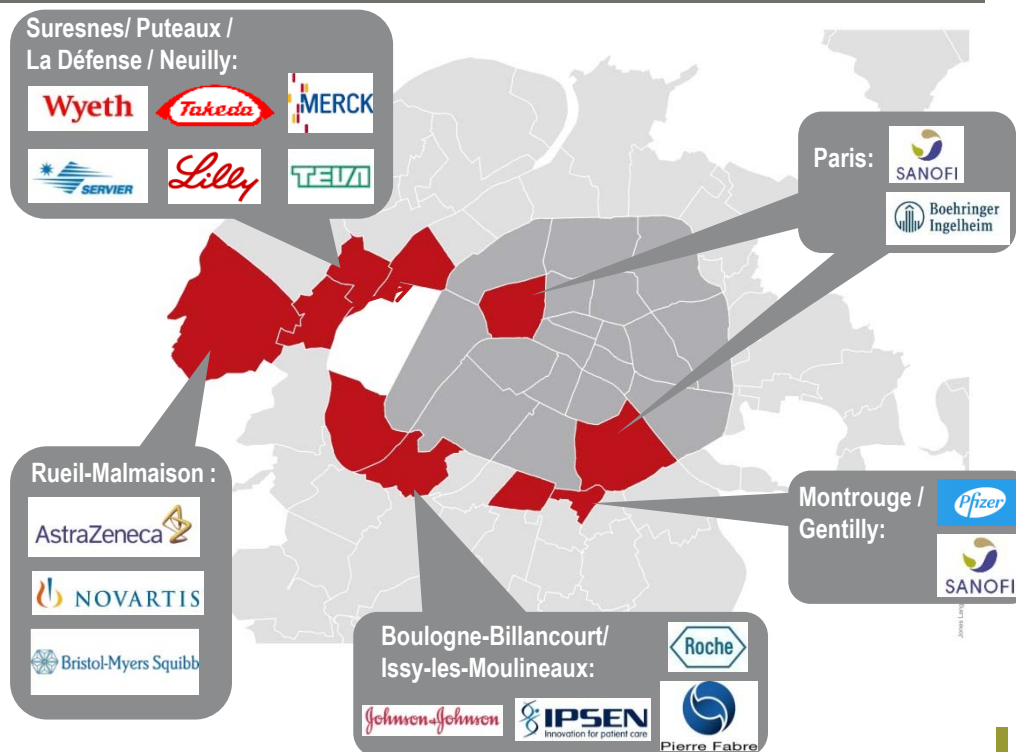
The ambitious plan for “Grand Paris,” a major urban planning project aimed at reinforcing the position of Paris as a leading city on the international scene, should also favor a concentration of high-level research institutes around the Medice cluster located in the southern suburb.

Real estate costs are naturally higher in the Paris area, compared to other regions, but the proximity to outstanding intellectual capacity, the good infrastructure and the higher visibility still outweigh the premium. Sanofi, which has settled in its new world headquarters in the central business district of Paris, at a very prestigious and renowned address, is a good example of the unwavering appeal of Paris.

Outlook

The life sciences market in France, like many mature life sciences markets globally, is in the midst of significant change, accelerated in the past months due to the sovereign debt crisis and reinforced by the politics of healthcare expenditure control. In France, many pharmaceutical companies are confronted with the end of their patents (and the expansion of generic drugs), which translates into a drop in fiscal resources available for innovation. Restructuring of operations, consolidation, mergers and acquisitions are therefore impacting the overall shape and geography of the sector, leading many industry participants to challenge and re-think the way they structure and coordinate their activities.

Hence, an important issue for life sciences companies is cost reduction via the rationalization of the real estate portfolio. Many large groups are looking at multisite consolidation options and lease renegotiation. Business rationalization is also having a clear impact on space utilization and translates directly into real estate strategies: for instance, via the introduction of more open plan designs for headquarters, increased densities or portfolio restructuring. Recent activity from Sanofi, Merck and Roche illustrate well the trends of real estate restructuring and rationalization. Sale-lease back transactions have also been favoured by some. Merck and Bristol-Meyers Squibb are two recent examples of companies that have chosen this route to raise capital and increase occupational flexibility.



The Paris region is home to almost all of the largest pharmaceutical headquarters, due to its strategic location, highly educated population and rich concentration of prestigious hospitals and high-tech R&D.

The Lyon Region

Overview

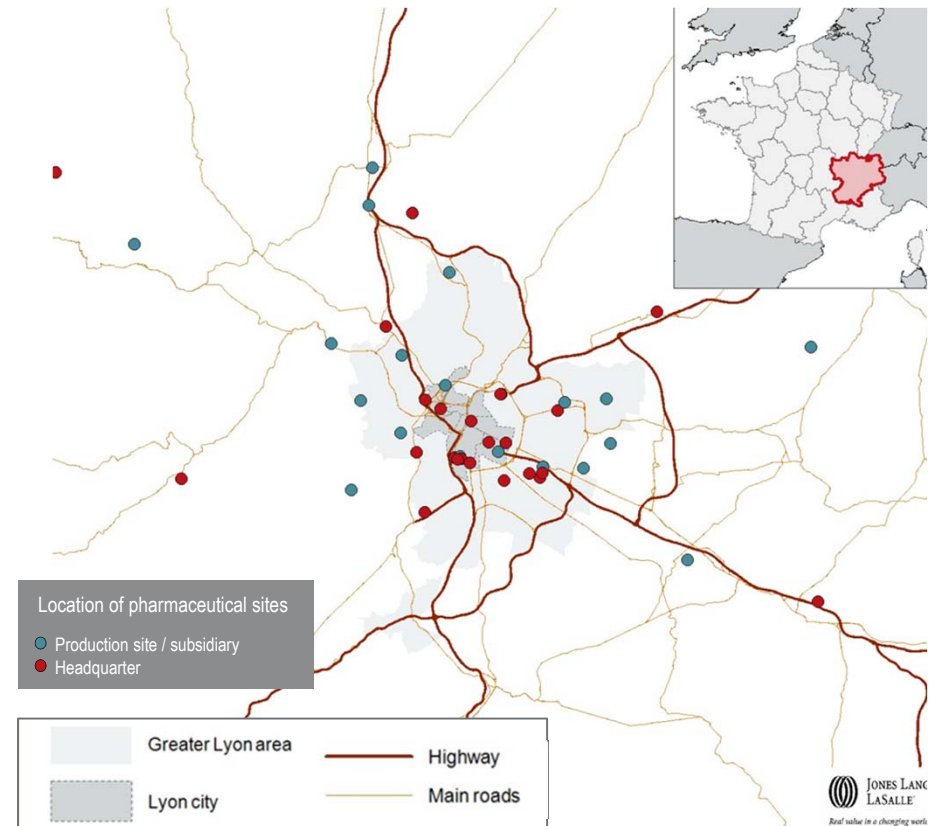
Apart from the Paris region, the French life sciences industry lies on several poles of excellence, spread across the country.

Among them, Lyon and its surroundings stand out as an important regional cluster, gathering some major headquarters, a high concentration of renowned research institutes and a good network of innovative startups and small ventures. The region also plays host to a significant proportion of the national pharmaceutical production facilities. Lyon is the top European centre for vaccine production and ranks second, behind Paris, for the number of life sciences-related jobs.

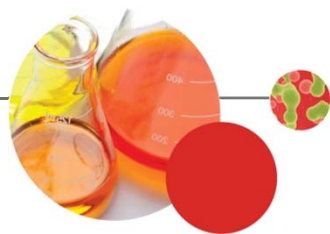
This importance of the Lyon region is linked to both historical and economic reasons.

First, the life sciences industry anchorage in the region is historically significant, with Sanofi Pasteur (number 1 in the world for human vaccines), Meriel (number 1 for veterinary products) and bioMérieux (number 1 for bacteriologic diagnosis) – all major pharmaceutical laboratories that were created in Lyon and maintain their headquarters through today.

Second, this regional dynamism is supported by the city governance. The biotechnology industry has been designated as a major asset to develop the city, with many favorable policy measures developed to ease the emergence of Lyon Biopole, a cluster specialized in vaccines and the diagnosis of infectious diseases.



The Lyon region stands out as an important regional centre of excellence for the pharmaceutical industry, benefiting from an important concentration of R&D and production units, favored by the local policy, together with the historical anchorage of some major laboratories.



Germany's life sciences sector is primarily anchored around the major cities of Munich and Berlin.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

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Germany market overview

The life sciences sector in Germany continues to grow in importance and is one the largest in Europe. Biotechnology is a particular area of focus, with revenues of dedicated biotechnology companies up 10.0 percent in 2011 compared to 2010, and the number of employees saw an increase by 5.0 percent.

Although R&D expenditures remained relatively high, they dropped slightly below the EUR 1.0 billion (\$1.3 billion)¹ level in 2011 for the first time since 2007. However, expenditures for research (an indicator of innovation activity) remained relatively stable. A major challenge for the sector continues to be the securing of financing, the EUR 187.0 million (\$236.7 million)¹ of fresh capital that was invested in 2011 represents a very low volume.

To ease this situation, a second round of the High-Tech Start-up Fund (HTGF) was announced in 2011. Some EUR 290.0 million (\$367.1 million)¹ will be provided to support young technology firms in the start-up stage. Further initiatives, like the "Spinnovator" fund or public-private partnerships, which are supported among others by the Federal Ministry of Education and Research, also will direct funding into the sector.

The pharmaceutical industry employs around 126,000 people in Germany and is growing. In addition to global companies such as Merck KGaA and Boehringer Ingelheim, Germany supports a large number of smaller life sciences companies. Germany ranks first in Europe for production of chemicals and biopharmaceuticals.

Life sciences has become a major driver of innovation for many other industry sectors. The biotechnology industry shows a continued growth, despite financial restraints. There are signs of better times ahead, as indicated by the rising number of venture capital funds. Federal government commitment and support is being provided by the National Research Strategy BioEconomy 2030 and the Health Research Framework Program. These initiatives provide subsidies of around EUR 8.0 billion (\$10.1 billion)¹ for the industry.

¹ Six-month average conversion rate of 0.79 Euros (EUR) per U.S. dollar, as of October 2012.

Industry statistics

8.1 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students **23.3%**

2.8% Gross expenditure on R&D, as percent of GDP

Total patent applications, residents only **47,047**

Berlin Capital Region

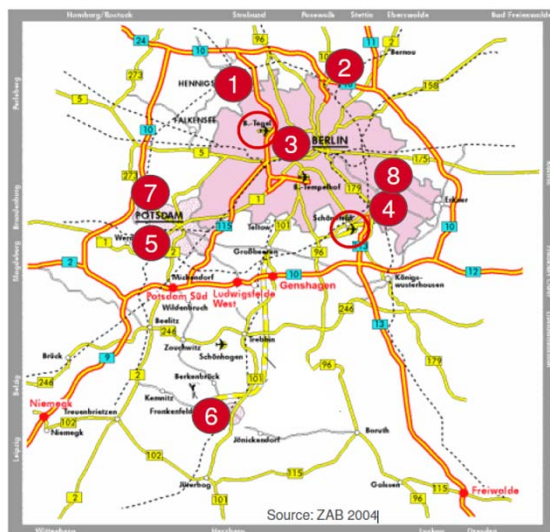
Overview

With 120 clinics, 280 medical technology companies, 215 biotechnology companies and 4,100 employees, the Berlin capital region is one of Germany's most important life sciences locations as it is the country's number one biotech location and among the top five in Europe. In addition, 30 pharmaceutical companies are located here, employing more than 10,000 people.

The region is home to the largest domicile of the Fraunhofer-Gesellschaft, the largest location of the Leibniz-Gesellschaft, and to the biomedical research centre of Helmholtz-Gesellschaft. The concentration of 24 large research facilities and life sciences research universities in this relatively confined area is unique in Europe. The positive growth in the Berlin biotech sector continued in 2011 with the main growth driver being research activity.

Outlook

It is expected that the number of employees in the Berlin region healthcare industry will continue to grow, from 350,000 currently to about 368,000 in 2030, generating a gross value added of approximately EUR 20.0 billion (\$25.3 billion).¹ With regard to public funding, the city of Berlin invests 3.4 percent of the GDP to extend its status as a successful research location – this is above average compared to other German cities.



Source: ZAB

The Berlin area provides various technology parks, including the Max-Delbrück-Centrum for molecular medicine and the Leibniz Research Institute for molecular pharmacology, both located on Campus Berlin-Buch.

Munich / Bavaria

Overview

More than 30.0 percent of all German biotech small and medium-sized enterprises (SMEs) are located in Bavaria. The number of biotech and pharmaceutical SMEs in Bavaria amounted to 166 in 2011, with 126 of them located in the Greater Munich Area. Of the additional 35 national or international subsidiaries biotech firms in Bavaria, the Roche Diagnostics in Penzberg, 60 kilometers south of Munich, is the largest with more than 4,800 employees. Nuremberg-Erlangen, the so called "Medical Valley" (a Centre of Excellence for Medical Technology), combines world-leading big and smaller enterprises like Siemens and Wave. Taking all biotech companies, SME and non-SME, together, the workforce amounts to 10,300. In addition to the jobs in the life sciences industry, there are also some 10,000 people working in the departments of Bavarian research institutions.

Outlook

The growth of this sector is set to continue. Various start-up initiatives, often with public subsidies, will help foster this sector. The fact that Bavaria was able to attract more than half of the external biotech funding for Germany underlines its importance as Biotechnology Cluster and its future viability.

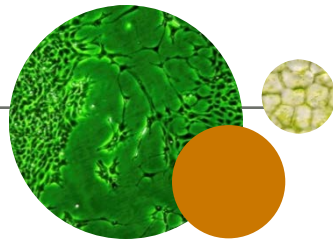
¹ Six-month average conversion rate of 0.79 Euros (EUR) per U.S. dollar, as of October 2012.

REVENUES TOTAL IN MIO. €, ALL BIOTECH SME TOGETHER



Source: BioM Biotech Cluster Development GmbH 2012

The Munich Biotech Region has been awarded at the Leading Edge Cluster competition by the German Federal Ministry of Education and Research. The support connected with this initiative will benefit the biotech sector.



The Dutch life sciences cluster has grown in size and output despite the economic downturn and shows a high increase in the amount of private investments raised.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

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Netherlands market overview

The Netherlands hosts a wide variety of life sciences occupiers whose locations are strongly influenced by presence of existing clusters or "knowledge campuses." The wide variety of life sciences occupiers provide a sizable contribution to the Dutch gross domestic product and the market is growing due to the aging population, higher occurrence of certain diseases and related medical innovations. As a result, the Dutch government has indicated that the life sciences sector is one of their main priorities and a "top sector," a sector in which the Netherlands excels globally and is a government priority.

The resultant action plan provides the government, industry and science with the opportunity to target investment in this sector. This is intended to enhance the attractiveness of the Netherlands in

the global life sciences market and will hopefully have a positive effect on all local life sciences clusters and campuses.

The geographic focus of the broader life sciences industry in the Netherlands is widespread due to the variety of life sciences occupiers and subsectors. Despite the spread, companies are largely concentrated in Eindhoven and Groningen. The sector located in Eindhoven is centred around R&D activities from Philips on the largest life sciences campus in the Netherlands, the High Tech Campus Eindhoven.

Medical-related life sciences companies are primarily located in the southern part of the Province Limburg and areas proximate to the Randstad conurbation. The decision to locate here is largely influenced by the presence of medical-related knowledge institutes. The agro-food sector is primarily concentrated in Wageningen (Food Valley) and the Kop van Noord-Holland region.

Industry statistics

5.2 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students

14.0%

1.8% Gross expenditure on R&D, as percent of GDP

Total patent applications, residents only

2,575

Amsterdam

Overview

The presence of several knowledge institutes, close cooperation with the city's two universities, the close proximity of the airport and a world class IT infrastructure all add to Amsterdam's appeal. In the Netherlands, the Amsterdam region has the largest concentration of research and education establishments focused on the medical sector. There are more than 4,000 researchers employed within the life sciences sector and approximately 6,000 students are currently getting their degrees within the life sciences and medical sectors. The largest life sciences cluster in Amsterdam is the Science Park Amsterdam, located on the east side of Amsterdam. It covers an area of 70.0 hectares and is home to the UvA Faculty of Science.

Outlook

In 2012, Amsterdam University College (AUC) will also be based here with an expected 2,500 students enrolled in science-related disciplines. In the longer term a business accommodation and laboratories (phased building work on 25,000 square meters) are planned as well.

Eindhoven

Overview

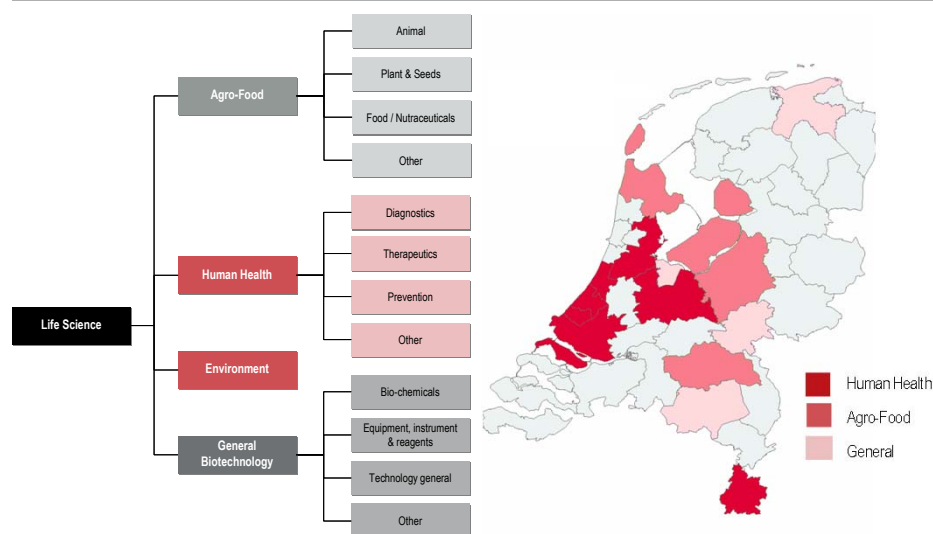
Eindhoven is generally considered the "Brainport" of the Netherlands as 45.0 percent of all R&D investments funnel into the region. Particular attention is paid to the High Tech Campus in Eindhoven (HTCE). The campus serves as a magnet to high-tech companies and research institutes and this in turn helps to strengthen the image of Brainport.

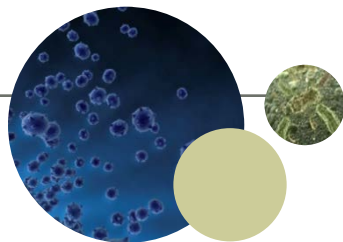
The HTCE is a business campus of over 100.0 hectares and currently houses more than 100 companies and institutes with over more than 8,000 employees. Campus companies strategically decide what knowledge, skills and R&D facilities they share in order to achieve faster, better and more customer-oriented innovation and are responsible for nearly 50.0 percent of all Dutch patent applications.

Outlook

Currently, a new HQ for Soliance Solar is being built – a 4,300-square-meter building that can be divided into approximately 1,900 square meters of office and 2,400 square meters of cleanroom. This development will be completed by end 2013.

Dutch life sciences sector diversification





Switzerland ranks No. 1 in the Global Competitiveness Report of the World Economic Forum and is home to several large leading life sciences companies.

Global trends

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Switzerland market overview

Switzerland is one of Europe's most established life sciences locations. Switzerland was again rated number 1 in the World Economic Forum's Global Competitiveness Report 2012–2013, reflecting its advantages for the life sciences industry and other research, production and service companies. Switzerland is also a leader in education and is one of the world's most active countries in research.

Aided by the proximity of top pharmaceutical companies such as Roche and Novartis, and by the strong financial sector in Zurich and Geneva, academic excellence in the biomedical sciences serves as a motor for innovation in the biotech and medtech sector. Therefore the density of biotech

companies in Switzerland is unparalleled worldwide. Numerous joint activities of universities and private companies provide favourable conditions for young start-up companies. Benefits such as low-cost rental space at the university's labs during the first years and the availability of biotech parks and business incubators in and around Zurich also support life sciences growth. The main clusters of life science activity can be found in Basel (BioValley), Zurich (Greater Zurich Area) and in Geneva (BioAlps).

As a result of the appreciation of the Swiss franc, caused by global macroeconomic uncertainty and Switzerland's safe haven status, short-term growth rates around 1.5 percent are forecasted. Despite the lower growth rate and increasing competition, Switzerland is likely to remain one of the world leaders in life sciences innovations. The strong position is supported by a balanced mix of academia, concentration of private life sciences companies and optimal infrastructure.

Large Swiss companies like Novartis, Roche, Syngenta and Nestle are traditionally owners and occupiers of their real estate properties. Other large developments, for example the Novartis Campus in Basel, are built-to-suit-projects. Jones Lang LaSalle estimates that about 75.0 percent of all properties used by life sciences companies in Switzerland are built-to-suit by their occupiers.

Industry statistics

6.0 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students **21.6%**

3.0% Gross expenditure on R&D, as percent of GDP

Total patent applications, residents only **1,622**

Basel (BioValley)

Overview

The area around the city of Basel is one major centre of the life sciences industry and approximately 40.0 percent of the world's pharmaceutical companies are located in this area. Its superior location in the border triangle of Germany, France and Switzerland leads to a highly international cluster of institutions and competences. More than 600 pharmaceutical and medtech companies, 10 universities, 15,000 scientists and various technology and life sciences parks offer an optimal infrastructure.

Established pharmaceutical and chemical companies like Novartis, Roche or BASF have large R&D and production sites located around Basel. As this infrastructure is specialized for the specific tenant's requirements, the market for this type of real estate is limited. Office and laboratory space in different price ranges is available in the numerous business parks.

Outlook

Novartis is planning a long-term campus development on a former production site. After the second construction phase, it will offer office space for up to 10,000 employees. Next to the R&D and headquarter facilities, the company plans to consolidate different smaller sites in Basel and to offer optimal surroundings for knowledge transfer.



Optimal conditions for researchers paired with the concentration of pharmaceutical multinationals favours Basel as one of the most important locations for life science companies.

Zurich (Greater Zurich Area)

Overview

The life sciences market in Zurich is influenced by the University of Zurich and the Swiss Federal Institute of Technology Zurich (ETH), which bear many promising spin-offs and start-ups each year. Additionally many international companies, including Bayer (Switzerland) AG and Novo Nordisk Pharma AG, value the high standard of life in Zurich and have chosen to locate offices or headquarters here. The high-quality infrastructure grants national and international connectivity and numerous technology parks within Zurich offer premium laboratory infrastructure and support the relationship between start-ups and universities. The Life Sciences Platform, a laboratory for biomedical research built by the ETH, will strengthen Zurich's international positioning.

With 21,000 employees in the life sciences field this submarket is the second-largest after the life sciences sector in Basel. The annual revenue accounts for CHF 40.0 billion (\$41.7 billion) and reflects nearly 4.0 percent of the GDP of the canton of Zurich.

Outlook

The newly reinforced organization Life Science Zurich put in a lot of effort to market the life sciences sector in and around Zurich. Spin-offs from some of the best universities in the world will generate additional demand for office and laboratory space during the next few years.

¹ Six-month average conversion rate of 0.96 Swiss Franc (CHF) per U.S. dollar, as of October 2012.



The newly built laboratory at the ETH and the accumulation of knowledge firms Zurich's important role in the life science market.

Lake Geneva (BioAlps)

Overview

The Lake Geneva area is an attractive life sciences location due to an extensive network of research and academic intuitions, more than 570 multinational companies, great infrastructure and the extraordinary accumulation of capital. The high concentration of international enterprises leads to a remarkable centre of competencies, which is why this area is favoured not only by established companies like Nestle and Merck Serono, but also by emerging biotechnical or medtech companies. The close proximity to one of the world's top universities, the École Polytechnique Fédérale de Lausanne (EPFL), boosts the attractiveness of the Lake Geneva area as it generates various spin-offs.

Due to limited availability of supply, large life sciences tenants in the market have focused on build-to-suits when considering relocation to this area. The science parks offer state-of-the-art premises such as The Science Park (PSE) offered by EPFL and the Y-Parc in the canton of Vaud.

Outlook

As the Arc Lémanique area continues to experience an increase in activity, a change in the type of necessary infrastructure is expected. However, the high build-to-suit fit-outs will prevent numerous transactions.



The EPFL and projects like CERN will increase the demand for life sciences facilities.



The United Kingdom's long-established and strong science base is one of the significant factors driving investment and development in the life sciences sector.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

United Kingdom market overview

The life sciences sector in the United Kingdom is among the largest in the world, and includes more than 3,500 medical and biotechnology companies that, combined, generate annual revenue of GBP 15.0 billion (\$23.8 billion).¹ When combined with pharmaceutical exports of GBP 18.0 billion (\$28.6 billion)¹ the United Kingdom (UK) is a major supplier of life sciences products and services across the globe.

The life sciences industry in the UK has a record of cutting-edge research and is renowned for developing innovative, effective solutions to global and local health issues. It has also served as a hub for scientific and business collaboration, bringing together funding from private and public sources to support innovation and create routes to market. According to U.K. Trade & Investment (UKTI) figures, United Kingdom industries spend around GBP 7.5 million (\$11.9 million)¹ each day on R&D, and have attracted major R&D investments from a range of the world's top life sciences

companies. As a direct result, the United Kingdom has created one in four of the world's top 100 medicines and 45.0 percent of all pipeline products in Europe.

Outlook

Despite the economic instability of the last few years, the life sciences sector has continued to show resilience and stable performance in the United Kingdom. Overall private sector employment in the United Kingdom is growing, and the government has recently announced a strong commitment to encourage growth in high-tech and R&D-led industries with a number of tax credits and incentives.

Restructuring and productivity gains from United Kingdom operations remain an important focus for life sciences companies as they adapt functions and locations in response to strategic pressures. Such rationalization has fuelled some disposal activity and selective head count reductions in some locations. But a significant level of new investment has also been seen through 2012, with a range of companies committed to expand and increase investment in facilities in the United Kingdom and other mature European markets. This combination of selective investment and continuing efforts to optimize productivity from existing operations is likely to dominate the outlook for life sciences over the next 12 to 24 months.

¹ Six-month average conversion rate of 0.63 British Pound (GBP) per U.S. dollar, as of October 2012.

Industry statistics

8.9 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students 21.7%

1.9% Gross expenditure on R&D, as percent of GDP

Total patent applications, residents only 15,490

Cambridge

Overview

Cambridge is one the United Kingdom's leading clusters based upon the strengths of Cambridge University. Cambridge University alumni account for 20.0 percent of the world's Nobel Prize winners in medicine and chemistry. The cluster is home to around 25.0 percent of Europe's biotechnology companies and the world's largest medical research charity, the Wellcome Trust, also has a base there.

Due to consistently high demand for lab and office space in Cambridge, the availability of large or self-contained units can be limited, although pockets of smaller space are more widely available. Rents range from GBP 18.00 (\$28.57)¹ per square foot per annum for shell and core lab space, to GBP 30.00 (\$47.62)¹ per square foot per annum for fully fitted space.

Outlook

Cambridge continues to attract strong interest from life sciences occupiers and this is expected to continue over the coming 12 to 18 months. Construction activity is relatively limited in Cambridge and surrounding markets which keeps availability of space low. For those companies looking to take space in the centre of Cambridge, as opposed to the science parks located in peripheral areas, the market is particularly constrained.



Due to consistently high demand for lab and office space in Cambridge, the availability of large or self-contained units can be limited.

South East of England

Overview

The South East of England is an important cluster for a wide range of life sciences companies. Benefiting from proximity to London and the world's busiest international airport, Heathrow, the South East submarket is a mature cluster that provides research sites for three of the top 10 major global pharma companies and a number of biotechnology firms.

Oxford is another cluster of importance for life sciences within the broader southeast region, with more than 100 biopharmaceutical / healthcare companies taking advantage of close links to the city's Oxford University. Much of the office and lab space is located out of town in science and business parks. The Oxford real estate market is stable with limited new construction keeping supply relatively limited. Conventional Grade A office space is available at GBP 22.50–GBP 25.00 (\$35.71–\$39.68)¹ per square foot per annum, with fitted lab space available at around GBP 27.50 (\$43.65)¹. Availability of office space is greater in the broader southeast, and the Western Corridor region, west of London, remains popular with life sciences companies.

Outlook

Oxford is expected to continue to benefit from international demand for office and lab space, based on research links to the university. The lack of new development will keep availability constrained. In the broader southeast, and western corridor region, availability is greater in out-of-town submarkets, with rents facing upward pressure and lower availability in town-centre locations.



The South East of England is an important cluster for a wide range of life sciences companies, benefiting from proximity to London.

¹ Six month average conversion rate of 0.63 British Pound (GBP) per US dollar, as of October 2012

London

Overview

Although many larger pharmaceutical and biotech companies base their operations outside central London, the cluster has representation of more than 100 bioscience businesses, not to mention 28 universities and five renowned medical schools. It is also home to UCL Partners, one of Europe's largest academic health science partnerships of hospitals and medical research centres.

London's West End is one of the most expensive office markets in the world. Although some life sciences companies maintain a small office presence in the exclusive areas of Mayfair and St. James, for practical purposes most locate in or around submarkets such as Paddington and Kings Cross near to the major hospitals, universities and research facilities. New Grade A office space in these hubs is available from GBP 55.00–GBP 60.00 (\$87.30–\$95.24)¹ per square foot per annum.

Outlook

Although rental growth is forecast to remain stable over the final quarter in 2012, providing the economy gains some forward momentum, we are likely to see prime rental growth return to the market in 2013 as pent-up demand starts to transact and we see a further tightening in supply.

Availability of prime space remains low, although availability is higher for Grade A and Grade B stock, and in secondary or peripheral submarkets.



Although many larger pharmaceutical and biotech companies base their operations outside central London, the city remains an important life science research hub.

North West of England

Overview

North West England is the United Kingdom's third largest bioscience cluster, with a number of global life sciences companies operating there. Manchester University is one of Britain's largest universities and recently collaborated with GlaxoSmithKline and AstraZeneca on a new research centre. AstraZeneca is one of the global pharmaceutical companies with a large base in the area.

The North West of England is further supported by the strong academic research capabilities of the Universities of Liverpool, partner hospitals and locally based national support facilities such as the National Biomanufacturing Centre.

Prime office space in Manchester city centre is available at GBP 30.00 (\$47.62)¹ per square foot per annum. Incentives remain tenant favourable with around 30 to 36 months achievable on a 10-year term dependent upon grade, type, characteristics and location of the building.

Outlook

It is anticipated that incentives will begin to reduce shortly – particularly for the more attractive stock in Manchester. Given the lack of development financing we are likely to see few new wholly speculative starts, although we can expect refurbishment of existing stock.

¹ Six-month average conversion rate of 0.63 British Pound (GBP) per U.S. dollar, as of October 2012.



North West England is the United Kingdom's third largest bioscience cluster, with a number of global life sciences companies operating there.

Scotland

Overview

Scotland is another important hub in the United Kingdom life sciences sector, with more than 500 life sciences companies, increasing by an average of 20.0 percent a year. Edinburgh is a hotbed of life sciences innovation with particular achievements in recent years in the field of stem cell research. The Queen's Medical Research Institute brings together four world class research centres specializing in Cardiovascular Science, Inflammation Research, Reproductive Biology and Regenerative Medicine. The Institute houses more than 600 researchers and aims to tackle a wide range of diseases at the most fundamental cellular level.

The supply of prime office space in Edinburgh is limited, and currently costs around GBP 27.50 (43.65)¹ per square foot per annum with incentives still generous at around 36 to 42 months achievable on a 10-year term. Glasgow's office market is also experiencing limited availability of prime office stock; however, there is greater availability of Grade B stock in more peripheral locations.

Outlook

Grade A office supply in both Edinburgh and Glasgow remains constrained with very limited new Grade A space currently available. This is likely to exert upward pressure on rents for this segment of the market. Occupiers faced with dwindling choice in the city centre locations may begin to seek good quality alternatives out of town. In particular, Edinburgh Park could become more compelling as a location for occupiers given the tram extension scheduled for completion in 2014.



Scotland is another important hub in the United Kingdom life sciences sector, with more than 500 life sciences companies, increasing by an average of 20.0 percent a year.

¹ Six-month average conversion rate of 0.63 British Pound (GBP) per U.S. dollar, as of October 2012.

Asia Pacific

The attractiveness of Asia Pacific as a market, as a research location and as a manufacturing base keeps growing. Demand for medicines is rising rapidly in countries such as China, India, Indonesia, Thailand and Vietnam.

Manufacturing standards are improving region-wide and the talent pool is enlarging.

Japan ranks second globally in terms of prescription drugs, after the United States, and has the region's second highest total health expenditure. Demand driven by the country's growing elderly population, faster new drug launches and easing pricing policies might not be enough to compound the weak growth of the domestic pharmaceutical market. On a buying spree, Japanese multinational companies are getting serious about expanding overseas.

By 2016, China will leapfrog Japan as the region's largest and the world's second biggest pharmaceutical market. China's eroded cost advantage as a production base is balanced by the quality of its talent pool, by its massive yet still largely underpenetrated domestic consumer market and by government support for the sector. Life sciences clusters in China are quickly emerging as top investment destinations. Beyond the major hubs that are already on Western multinationals' radars, Chinese domestic companies are taking position in less known clusters.

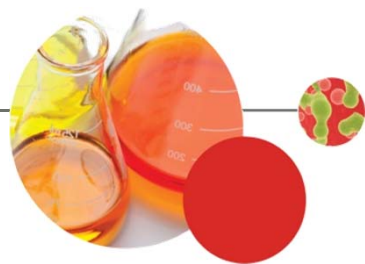
Fueled by a large population base and a growing middle class, India's life sciences industry has achieved double-digit growth in many areas and the country has the potential to become a major pharmaceutical hub and a lucrative destination of clinical trials for global giants. Foreign companies, however, may still encounter some challenges, such as legal infrastructure, when operating in the country. Existing clusters will benefit from progress made in high-tech infrastructure and human capital.

Another double-digit growth market, Indonesia, is anticipated to rank as the sixth largest pharmaceutical market in the region by 2016. Change in legislation will boost the attractiveness of this "pharmerging" market. The country is also set to tap into increasing outsourcing opportunities from Western countries.

Already housing contract research and manufacturing activities, Singapore's life sciences clusters are aiming to develop in the high-tech aspects of research and innovation. Supported by strong intellectual property protection laws, stable political structures and favorable tax policies, growth in the industry is expected to continue, in particular in the biologic sector on the back of massive investment by several large biotech and pharmaceutical multinational companies.

Four of the largest global pharmaceutical companies already earn a third of their revenues outside of their traditional markets of the United States, Western Europe and Japan. A vast majority of the sector's multinationals are reinforcing their presence in Asia Pacific. At the same time, domestic pharmaceutical companies are consolidating and expanding outside their home bases, competing with Western multinationals for space in the region's most dynamic life sciences clusters.





China is quickly emerging as a top destination for life sciences investment due to its huge market potential (large population, improving public healthcare systems and increasing healthcare expenditure as a percentage of GDP) and relatively low cost manufacturing sector.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

China market overview

China's pharmaceutical industry has enjoyed massive growth over the past decade. With the world's largest population, second largest economy and a growing middle class, China's prospective consumer base is unmatched by any country worldwide. The country's emergence onto the radar screen of multinational life sciences companies parallels its growth into one of the world's dominant economies with an increasingly open and inviting marketplace and waves of foreign investors lined up to take part. As for multinational companies that have been active in China for decades, they are changing strategy and shifting their focus away from merely exporting to domestic markets.

In the past, one of the primary reasons for interest in China was its low-cost manufacturing capabilities, but this advantage is gradually diminishing. Historically, Western pharmaceutical makers enjoyed a 30 to 50 percent cost savings by relocating the manufacturing of intermediates, APIs, starting materials and some finished drugs to China. Today, effort has shifted toward expanding capabilities beyond production into more high-tech R&D functions, as manufacturing costs and wages have increased and concerns over the protection of intellectual property are diminishing.

The life sciences industry has expanded beyond traditional clusters in China's eastern and southeastern regions to new areas around major cities in central and western China. Clusters remain the strongest around the sources of the best talent, so Shanghai and Beijing remain the key pharmaceutical R&D candidate bases, due to the presence of China's top five universities and proximity to renowned hospitals. For example, Merck rolled out a five-year, RMB 9.5 billion (\$1.5 billion)¹ project to build a new facility in Beijing for 600 researchers focused on drug discovery and translational research. Other clusters include cities such as Tianjin, Guangzhou, Suzhou, Wuhan and Xi'an.

¹ Six-month average conversion rate of 6.31 Chinese Yuan Renminbi (RMB) per U.S. dollar, as of October 2012.

Industry statistics

1.5 Researchers in science, per thousand total employment

Total patent applications, residents only 293,066

1.7% Gross expenditure on R&D, as percent of GDP

Active manufacturing clusters include:

- China Medical City in Taizhou China Medical City High-Tech Zone – AstraZeneca, Boehringer-Ingelheim, Takeda and other leading pharmaceutical companies have construction projects here
- Greater Hangzhou region – MSD, Novartis, Lilly and Sanofi Aventis have operations here
- Greater Tianjin - where companies such as GlaxoSmithKline, Takeda and Novo Nordisk are based
- Yangtze River Delta (which includes Suzhou, Taizhou, Hangzhou and Wuxi) and Tianjin – two key candidate regions considered by multinational pharma firms

China is estimated to have over 4,500 pharmaceutical manufacturers and 8,000 distribution companies, with a fairly even distribution among state-owned, private domestically owned and foreign-owned enterprises. The market is fragmented, with no dominant domestic companies.

Chinese pharmaceutical manufacturers largely focus on nonbranded generics, whereas large foreign companies have so far been interested primarily in manufacturing. However, state funding and a return of domestic talent from abroad have fueled the rapidly growing biotechnology sector. Domestic start-ups and multinational companies now compete in this growing market. Domestic companies involved in bio and pharmaceutical R&D include C&O Pharmaceutical Technology headquartered in Hong Kong, NYSE-traded Wuxi Pharmatech in Jiangsu Province, Shijiazhuang Pharma Group from Shijiazhuang in Hebei Province, state-owned Harbin Pharmaceutical Group, NASDAQ-traded Sinovac Biotech in Beijing and Zensun Sci & Tech Co in Shanghai.

Multinationals are taking bolder steps to secure a strong foothold in the market, as highlighted by AstraZeneca's announcement in 2011 to invest over RMB 1.3 billion (\$200.0 million)¹ on a new plant in Taizhou Medical High Tech Zone (China Medical City). This investment represents AstraZeneca's biggest ever investment in a single production facility and is in addition to the group's decision to open its China Innovation Center in Pudong, Shanghai, in June 2012. The facility will turn out injectable and oral drugs for the domestic market.

In a decision strengthening China's position as a leading destination for contract research organizations (CRO), Quintiles announced in June 2012 that it would invest RMB 88.3 million (\$14.0 million)¹ to build its new regional headquarters in Shanghai and establish a partnership with the Shanghai Clinical Research Center (SCRC) to provide lab testing capabilities for local customers. Pharmaceutical multinationals are increasingly outsourcing and the list of companies looking to Chinese CROs to slash R&D budgets, lower development costs and enter the China drug market is growing. Beijing-based Pharmaron is in a partnership with Merck Serono since 2011 and inked a multiyear deal with AstraZeneca in 2012. The deal adds a few hundred scientists to AstraZeneca's China team of about 300 and is its biggest move in China to date. It was preceded by another CRO deal with WuXi PharmaTech to develop and commercialize a biologic product.

In 2011, Pfizer decided to relocate its antibacterial research unit from Groton in the United States to Shanghai, where it is setting up its new Pfizer China Research and Development Center. The move

was meant to get closer to important hubs for science and technology research and to give the company better access to the Chinese drug market. Other large pharmaceutical companies with research operations in China include Eli Lilly, Roche, Novartis, Bayer, Bristol-Myers Squibb, Novo Nordisk and Sanofi-Aventis.

The drug distribution system in China is highly fragmented with innumerable small-scale, local distributors, generating huge inequalities between urban and rural patients and increasing the risk of counterfeit drugs entering the supply chain. To fight these issues, improve delivery times and reduce costs, the latest "Five-Year Plan" emphasizes the goal of building up the distribution network for pharmaceutical products, following more mergers and acquisitions by biotech companies. The plan envisions that, by 2015, China will have up to three Tier I pharmaceutical distributors with a national reach and revenues of RMB 100.0 billion (\$15.8 billion).¹ The plan also suggests the establishment of 20 Tier II regional distribution businesses with revenues of RMB 10.0 billion (\$1.6 billion).¹

Industry framework

Intellectual capacity

The lack of a workforce with specialized knowledge and skills relevant to the pharmaceutical industry used to pose a real challenge in China, as in most emerging markets. To combat this, the government has been working to attracting expatriates. Financial incentives and modern laboratories offered by the government as part of the "Five-Year Plan" have, to date, attracted 150,000 Chinese professionals back to their native country, along with the education and industry experience they gained abroad. Over 80,000 PhDs in the life sciences from Western establishments have returned to China, bringing expertise to a wide range of fields. Today, the talent availability is excellent, thus companies can hire increasing numbers of science graduates who have globally competitive skills.

Innovation capital

Since 2010, China has invested massive amounts of capital in order to become a center for pharmaceutical R&D with global status via its national R&D drug research programs. For example, the five-year Mega New Drug Program launched in 2009 includes a stimulus package for new drug development of RMB 12.0 billion (\$1.9 billion)¹ to be invested between 2011 and 2015.

¹ Six-month average conversion rate of 6.31 Chinese Yuan Renminbi (RMB) per U.S. dollar, as of October 2012.



Traditional Chinese medicines (TCM) are also receiving unprecedented government support and funding to develop drugs and diagnostic tools targeted at chronic illnesses. Researchers are encouraged to identify and reproduce active ingredients from roots and herbs to submit them to Western-style clinical tests to gain wider acceptance. A few TCM are already recognized worldwide, such as the malaria treatment artemisinin.

Although the main recipients are likely to be domestic laboratories and e-pharmaceutical companies, foreign firms and universities with industry expertise or proprietary technology can also partner with Chinese groups and thus access this attractive funding and large domestic patient pool.

Several research parks, some of them funded by the government, are located throughout the country, supporting budding science and technology enterprises. They include Zhangjiang Hi-Tech Park in Shanghai, Zhongguancun (ZGC) Life Science Park in Beijing Municipality and Suzhou BioBay in Dushu Lake Science and Innovation Education District.

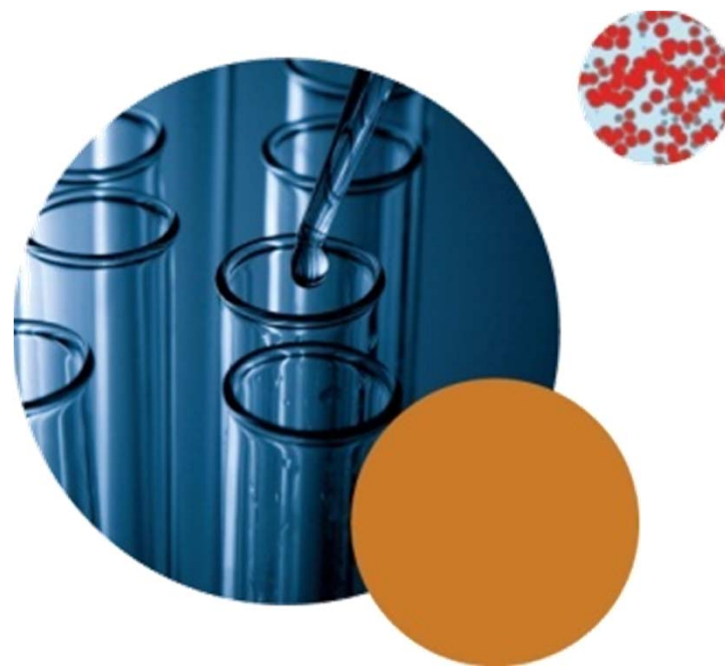
Fiscal and political resources

The Chinese government is trying to entice foreign and domestic investments in the life sciences industry, spending billions on the advancement of science and technology. The “12th Five-Year Plan” proposes a budget dedicated to biotechnology applications in the life sciences industry; the Chinese government will reportedly use RMB 10.0 billion (\$1.6 billion)¹ to fund major new drug innovation, with an average funding of RMB 5.0 to 10.0 million (\$792.4 million to \$1.6 billion)¹ per project from 2011 to 2015.

Recognizing the potential of its emerging life sciences industry, the government is working on multiple initiatives to encourage further development. As part of an economic stimulus package, the government allocated over RMB 850.0 billion (\$134.7 billion)¹ for healthcare improvements and intends to strengthen its basic health system while deepening reforms during the 2011 to 2016 period. Thanks to the RMB 782.4 billion (\$124.0 billion)¹ boost supplied during the first tranche of the 2009 to 2020 Healthcare Reform Plan, the country's health spend as a percentage of GDP increased to 5.1 percent, from 4.7 percent, and national medical insurance coverage now exceeds 90.0 percent.

As part of this national effort, price controls were put in place on several hundred drugs by the National Development and Reform Commission (NDRC) to improve their affordability. Biotechnology – including agricultural biotechnology, bio-manufacturing and fuels – is one of seven strategic emerging industries identified in the “12th Five-Year Plan.” The plan calls for government spending of over RMB 12.0 billion (\$1.9 billion)¹ to support the growth of the biotech sector through 2015.

New Good Manufacturing Practices (GMP) rules became effective in March 2011, rolling out elevated standards and greater emphasis on pharmaceutical quality control systems. Although the new GMP rules are expected to raise manufacturing and production costs, the enhanced standards will level the playing field in terms of quality and safety of drugs produced in China. Multinational



companies and Chinese manufacturers already operating at high GMP standards will be largely unaffected.

Outlook

IMS Health predicts that, by 2016, China will leapfrog Japan as the second biggest pharmaceutical market in the world behind the United States, with sales of about RMB 1.0 trillion (\$160.0 billion).¹ The expected 15.0 to 18.0 percent growth rate to be derived mainly from government spending will be made possible by economic growth and rising healthcare demand as the insurance market matures. Further, for 37.0 percent of pharmaceutical and life sciences CEOs interviewed by PwC for its 15th Annual Global CEO Survey, China is a top source of future growth.

As a production base, China's cost advantage has been eroded by inflation, rising wages, currency appreciation and challenges to the many tax reductions and rebates that China has traditionally offered to its own exporters. These various pressures will certainly reduce China's ability to undercut foreign markets. Balancing these trends, current talent availability, the improved funding environment via government support and the increase in quality facilities will all change the manner in which China competes in the industry. China no longer has to be viable as a low-cost destination to attract industry interest and investment. Certainly, the outlook for life sciences in this immense and growing economy is good. Challenges faced by pharmaceutical companies include China's rising but still weak protections for intellectual property and GMP compliance, navigating the legislative environment and ensuring market access comparable to domestic companies.

¹ Six-month average conversion rate of 6.31 Chinese Yuan Renminbi (RMB) per U.S. dollar, as of October 2012.

Industry Framework Trends

Venture Capital funding incentivized by opportunities beyond manufacturing

Capital has flowed into China's medical and pharmaceutical industries in growing volumes over the past few years as companies look to secure a strong market share in one of the most promising sectors in one of the world's strongest economies.

In 2011, total investment in the form of private equity and venture capital investment reached a high of RMB 5.7 billion (\$907.0 million).¹ During the same year, foreign direct investment in the industry grew to an all-time high of RMB 7.6 billion (\$1.2 billion).¹ More and more, foreign pharmaceutical companies are looking beyond China's low-cost manufacturing capability, and are now motivated to increase their investment in the country to access the domestic market for healthcare products and services.

Government support is key to the long-term growth of a life sciences cluster in China

In addition to implementing stimulus measures to improve investment and resource allocation to the industry as a whole, municipal governments continue to play a key role in the planning and development stages for major clusters such as Zhangjiang Hi-Tech Park and Zhongguancun Life Science Park.

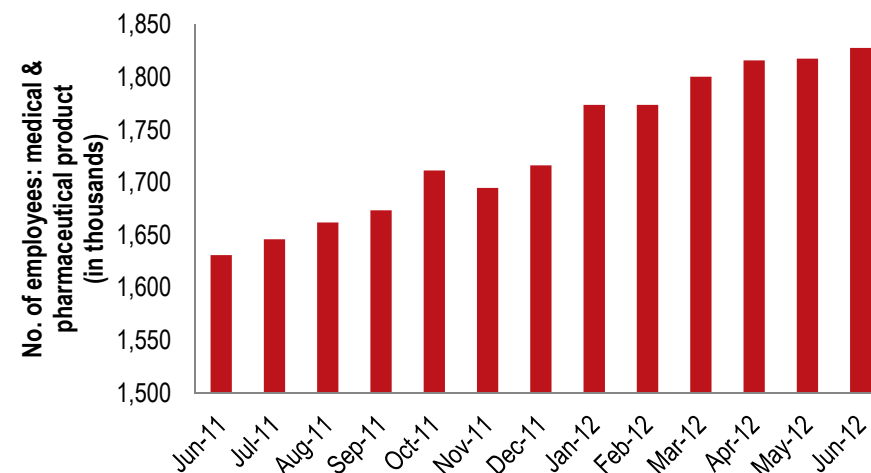
Zhangjiang Hi-Tech Park, sometime referred to as the Silicon Valley of China, has become the destination of choice for pharmaceutical companies in Shanghai thanks to its long track record of investment by multinationals and its convenient location – a 45-minute drive from downtown Shanghai in Pudong District.

Industry employment steadily increases

Employment in this industry has grown rapidly alongside the increase in investment and resource allocation for medical and pharmaceutical products in China. As of June 2012, employment in the medical products field had grown to more than 1.8 million workers, adding an impressive 196,000 workers from one year earlier.

Higher quality education and industry experience abroad have ensured that the talent necessary for growth in China can now be sourced from within the country rather than relying primarily upon outside talent. As the government continues to encourage medical industry education and as Chinese professionals return in growing numbers from abroad to work in life sciences-related fields, employment shows no signs of slowing down in the future.

Employment



Source: CEIC

¹ Six-month average conversion rate of 6.31 Chinese Yuan Renminbi (RMB) per U.S. dollar, as of October 2012.

Beijing Daxing District

Overview

Compared with other science parks, the most competitive advantage of Daxing District is the industrialization and the efficient public service platform for the life sciences industry. The government provides strong support for innovation and new drug approval.

There are two parks oriented toward life sciences in Daxing District: the Beijing Economic and Technological Development Zone (BDA) and the Daxing Biomedicine Industrial Base (CBP).

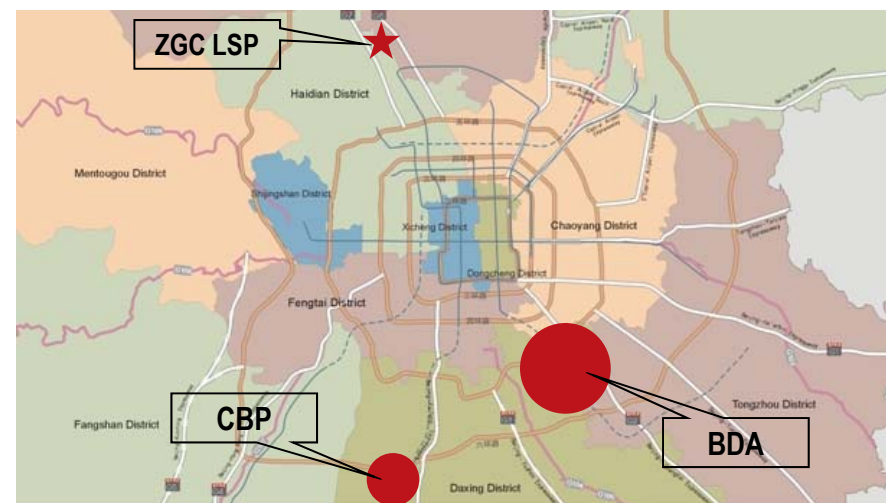
Known as “medical valley,” BDA is one of the three national biological pharmaceutical innovation incubator bases. Biomedicine is one of the leading industries in BDA. Foreign and domestic companies based here include Bayer, Sanofi, Tide and Tongrentang. Since its integration in Daxing District in 2010, BDA has counted life sciences among its six leading industries. The area offers many advantages in terms of fiscal incentives, tax concessions, innovation, talent and distribution. The E-town Biomedical Park, located in BDA east zone, is the public biomedical service platform of technology support, public infrastructure and incubation, with 178,176 square meters of gross floor area (GFA).

Conveniently located at the intersection of Jingkai Expressway and South Sixth Ring Road, CBP covers a 9.6-square-kilometer phase I planning area. In 2006, the park was allocated into the Zhongguancun Science Park and benefited from the ZGC’s “1+6” policy. CBP’s revenue reached RMB 9.1 billion (\$1.4 billion)¹ in 2011, with its industrial activities having diversified from pure manufacturing to R&D, as well as high-end manufacturing and health services.

Outlook

The Daxing District aims to become a leading modern biomedical industry hub, covering all aspects of the life sciences industry chain, from R&D and manufacturing to sales and service.

¹ Six-month average conversion rate of 6.31 Chinese Yuan Renminbi (RMB) per U.S. dollar, as of October 2012.



BIOCYTOGEN

leased a whole floor of 2,000 sqm in the E-town Biomedical Park. The asking rental rate was RMB 2.90 per sqm per day in mid-2012.

CRO / CMO SERVICE PLATFORM

The CBP cooperated with several outsourcing enterprises to establish a CRO and CMO service platform to facilitate the application of R&D into production.

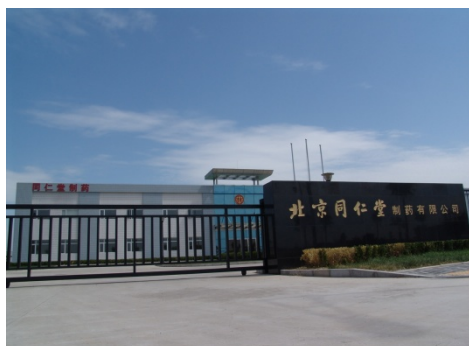
BEEHALL

In February, BeeHall purchased 25,060 sqm industrial land in CBP, the turnover was RMB 25.5M with land price of RMB 1,018 per sqm.

BIOTECH PHARMA

In May, Biotech bought 17,759 sqm industrial land in BDA core area, the land price was RMB 1,100 per sqm with planning GFA of 35,517 sqm.

Compared with other parks, BDA and CBP's unique competitive advantages are the convenient drug approval procedure and the strong support to innovation. The Daxing District is trying to become a national biomedical innovation base with global influence.



(left to right): the Tongrentang CBP factory and the Bayer BDA factory

Activity key:

Leasing Development Sales Tenants in the market Large blocks of space

Beijing Zhongguancun (ZGC) Life Science Park

Overview

Developed by the Beijing municipal government, Zhongguancun (ZGC) Life Science Park includes a two-phase master plan that will cover over 240.0 hectares. Phase I of the project includes a new enterprise incubation center, a small business development center, R&D facilities, industrial production facilities and a medical service area, totaling roughly 540,000 square meters. Phase II includes 830,000 square meters of medical care and commercial space that integrates the clinical, research and teaching resources of the Chinese Academy of Medical Sciences and the Peking Union Medical College. In April 2012, Zhongguancun Development Group and China State Construction established a joint venture to carry out Phase III that will focus on three functions: high-end industrial transfers, R&D centers and the regional headquarters of major global biopharmaceutical and healthcare companies.

Outlook

In August 2012, Zhongguancun Life Science Park was identified as the first batch of foreign trade transformation and upgrade by the government. The Beijing Commercial Municipal Commission will introduce a foreign trade service platform and upgrade the branding and the distribution network to attract more world-leading biomedical companies to the life sciences park.

J&W BIOTECH

a recent JSR and Wantai JV, leased 600 sqm of manufacturing space from Wanhai.

BOYA C-CENTER

is the only project for sale, with a 117,000 sqm GFA and an asking price of RMB 17,000 per sqm.

PHASE II

A 45,000 sqm GFA Biotech R&D Center is under construction, and will be completed at the end of 2012.

PKUCARE PARK FOR LEASING

Phase I (80,000 sqm) will be on the market in Q4 2012, the asking rent is RMB 3.50 per sqm per day.

After the Changping subway line opened in 2010, the convenience of travel to the ZGC Life Science Park attracted more attention from global pharmaceutical enterprises.

To date, the park owns seven state-level R&D centers, and has received over RMB 20.0 billion in investment.

Suzhou Industrial Park's BioBay

Overview

Located in Suzhou Industrial Park's Dushu Lake Science and Education Innovation District, the Suzhou BioBay park spans 86.3 hectares and offers innovation incubator and accelerator support for the development of the emerging biological and nanotechnology industries. Suzhou BioBay includes an industrialized area, an administrative office and several residential facilities. The Suzhou Institute of Nano-tech and Nano-bionics and the Chinese Academy of Sciences are present at Suzhou BioBay.

Suzhou BioBay has developed capabilities for gene technology and nanotechnology with the most complete industrial chain and the highest industrial agglomeration level in China. The gene technology cluster covers the complete industrial value chain consisting of the gene reagent development, gene detection service, gene diagnostic and gene therapeutic drug research and development (R&D), gene engineering drug and vaccine R&D. Based on the strength of the existing microelectronic and photoelectric manufacturing in Suzhou Industrial Park, BioBay's nanotechnology cluster focuses on developing five major nanotechnology applications: new nano materials, nano-photoelectronics, nano-biopharmaceutical, micro/nano system manufacturing, nano energy saving and environment protection.

Outlook

Phase III of BioBay will be completed in late 2012 and will contain larger size R&D offices, laboratories and light factories.

APPTec

Mid-2012, Apptec leased a build-to-suit (BTS) building of about 6,000 sqm.

SHURE

is in the market for 20,000 sqm, including manufacturing, R&D and administrative space.

BIOBAY PHASE III

To be completed in 2012, Phase III includes larger size R&D offices, laboratories and light factories.

SUZHOU INT'L SCIENCE PARK VIII

To be completed in 2014, includes lab, R&D, office and manufacturing

Led by strong incentive policies and professional services along the industry chain, BioBay has successfully attracted over 160 companies and gained an annual revenue of over RMB 880.0 million.

Chengdu's TLSP and CIHC Parks

Overview

Tianfu Life Science Park (TLSP) in High-Tech Zone and Chengdu International Health City (CIHC) in Wenjiang Zone are Chengdu's two life sciences-oriented parks.

As the gateway for the life sciences industry in Western China, TLSP is supported by the Chengdu municipal government and the Chengdu High-Tech Zone. Foreign and domestic companies located in TLSP include Renhe Pharmaceutical Group, Jiangsu Hengrui Medicine, ChemPartner and West China Hospital.

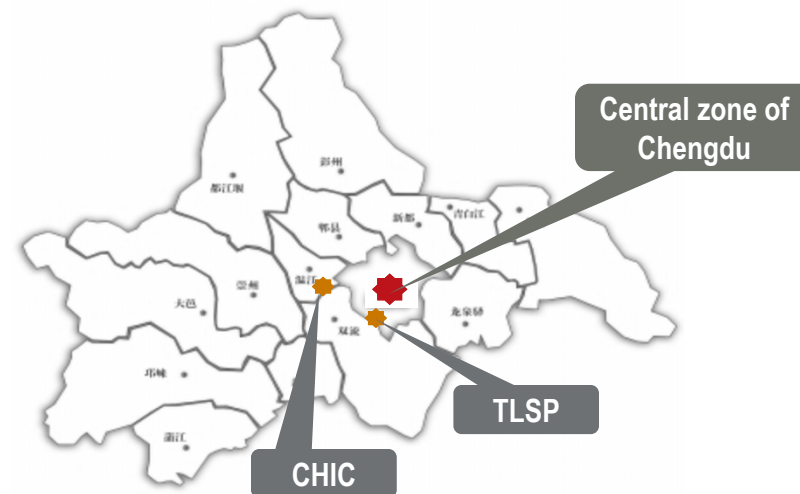
Approved in 2008 by the Chengdu Municipal Government, the CIHC project is a professional, international, diversified medical rehabilitation and health service platform covering a total area of 30.0 square kilometers. CIHC is a pioneer as a Chinese modern medical industry cluster that integrates health interventions, health services, medical tourism, education and research and business supports.

Outlook

The biomedicine and health sector is included in Chengdu's "12th Five-Year Plan" as a major developing industry, and benefits from fiscal incentives, tax concessions and other supporting policies for innovation, talent and distribution. CIHC will pool domestic and international resources to develop this industry. TLSP will reinforce its role as a cooperation platform between international and western China medical institutions



(left to right): Chengdu International Health City and Tianfu Life Science Park.



TLSP ASKING RENTS

At TLSP, the approximate asking rental price is RMB 1.33 per sqm per day in 2012.

CIHC ASKING RENTS

At CIHC, the asking rental price for an office building is around RMB 1.50 per sqm per day.

MEDICAL TRANSFORMATION CENTER FOR SALE

The asking sales price for West China Hospital's 17,500-sqm Medical Transformation Center is about RMB 6,500 per sqm.

DEVELOPMENT COMPLETE

Construction of TLSP's 221,553-sqm area, including seven R&D buildings, two offices and one incubation center, is completed and is available for sale and leasing.

With strong support and attention from the Chengdu municipal government, the biomedical and health industry is expected to attract more leading companies. Both TLSP and CIHC are aiming to become national best practice parks.

Activity key:

Leasing

Development

Sales

Tenants in the market

Large blocks of space

Shanghai Zhangjiang Hi-Tech Park

Overview

Zhangjiang Hi-Tech Park was established in Shanghai in 1992 as China's state-level, high-technology, industrial development zone. A multitude of national companies are based here, in addition to start-ups and other companies looking to benefit from its incubator program. According to the "12th Five-Year Plan," Zhangjiang Hi-Tech Park will maintain its investment in industrial fixed assets at RMB 20.0 billion (\$3.2 billion)¹ a year to total RMB 100.0 billion (\$15.8 billion)¹ by year-end 2015. Earlier this year, EMD Millipore opened a 2,601-square-meter Biopharmaceutical Technical and Training Center in the park to support manufacturers in the area with GMP compliance.

Zhangjiang Biotech and Pharmaceutical Industrial Base was founded in 1994 as the core area of the Shanghai State Bio-Industrial Base. After more than 15 years of development, the base has gathered over 400 domestic and foreign life sciences companies, research institutes and related service institutions.

Outlook

There were 69 new projects under construction in 2012 in Zhangjiang Hi-Tech Core Park and Shanghai Pudong Kangqiao Industrial Park. Ten projects in Shanghai International Medical Zone (SIMZ) exceed a total construction volume of 4.0 million square meters, with a total investment of RMB 3.8 trillion (\$602.2 billion)¹ over an area of 689,300 square meters. SIMZ's ambition is to become a modern medical science hub with advanced technology and sustainable design. The most representative project is the Shanghai International Medical Center, which has a total investment of RMB 800.0 million (\$126.8 million).¹ It will form "1+x," a complex hosting a general hospital and many specialized hospitals providing high-end medical service for patients from the Yangtze River Delta Region.

¹ Six-month average conversion rate of 6.31 Chinese Yuan Renminbi (RMB) per U.S. dollar, as of October 2012.



(left to right): Zhangjiang Pharma Valley and Dupont R&D center in Zhangjiang.



Source: www.zjpark.com

RIISING RENTAL RATES

Due to the lack of new supply in the Zhangjiang Biotech & Pharmaceutical Industrial Base, the average asking rental rate reached RMB 3.7 per sqm per day in 2012, up 12 percent from 2011.

4.0M SQUARE METERS UNDERWAY

Major industrial projects kicked off in 2012 in Zhangjiang Hi-Tech Park, amounting to a GFA of 4.0M sqm for a total investment of RMB 26.0 billion.

INDUSTRIAL LAND SALE

In January 2012, a domestic biochemical enterprise purchased 40,806 sqm of industrial land in the South Zhangjiang area. The average land price is RMB 3,071 per sqm.

ROCHE

is in the market for 20,000 sqm in Shanghai.

Zhangjiang Hi-Tech Park was recently expanded to incorporate Kangqiao Industrial Park and Shanghai International Pharmaceutical Park. Its total area reached 75.9 square kilometers after the three areas merged together.

Activity key:

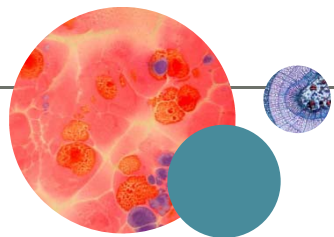
Leasing

Development

Sales

Tenants in the market

Large blocks of space



India's pharmaceutical market is largely driven by its domestically produced generic drugs. Although the life sciences industry has achieved double-digit growth in many areas, its size remains proportionately small for a nation with a billion people.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

India market overview

The Indian life sciences industry is one of the country's flagship sectors and the third largest producer of pharmaceutical products worldwide (by volume); the sector is growing at a rate of 15.0 to 20.0 percent per year. The Centre for Monitoring Indian Economy (CMIE) reported that the India pharmaceutical market reached INR 104,944.0 crore (\$19.2 billion)¹ in the 2010 to 2011 period, driven by the high economic growth and high-value chronic therapy segment (such as oncology, diabetology and cardiology) reflecting the growing lifestyle changes in the population.

Indian pharmaceutical companies continue to move to the center stage of the global pharmaceutical market, driven by their increasingly strong biotech and drug synthesis skills, high-quality and vertically integrated manufacturing assets, differentiated business models and significant cost advantages. In 2009, Ernst & Young reported that over 120 facilities in India were approved by the United States Food and Drug Administration (FDA), the highest number outside the United States.

A self-reliant industry with tangible production-related cost advantages, the industry in India produces a full range of products and meets around 70 percent of the country's demand for the full suite of pharmaceutical products. India's life sciences industry is predominantly made up of manufacturing entities, contract manufacturing organizations (CMOs), and has a small, but fast-growing, representation in biotechnology.

The production of generics, for both domestic and global use, is India's most robust sector of the industry. Domestic demand for pharmaceuticals has increased in recent years due to improved access to medical care and rising average income. On the export front, India produces more than

¹ Six-month average conversion rate of 54.7 Indian Rupee (INR) per U.S. dollar, as of October 2012.

Industry statistics

0.4 Researchers in science, per thousand total employment

Total patent applications, residents only 7,262

0.8% Gross expenditure on R&D, as percent of GDP

20.0 percent of the world's generics and exports its products to over 200 countries around the world, with the United States being the largest export destination. It continues to gain the interest of global companies due to cost savings and the large presence of FDA, UK Medicines Control Agency (MCA) and European Medicines Agency–approved facilities.

The life sciences industry is largely situated among three of India's 28 states, namely Maharashtra, Andhra Pradesh, and Gujarat, with smaller representation in the states of Goa and Karnataka. The first three states make up most of India's pharmaceutical presence. Formation of these clusters was aided by sector-specific Special Economic Zones (SEZ) and a mix of government-developed and privately owned industrial parks.

The Indian life sciences industry is highly fragmented. The organized sector of the industry accounts for about 70.0 percent of the total market value, with the top 10 players holding a third of the total market share. Among the top 20 big pharmaceutical companies worldwide, 15 have a presence in India. Most large multinational pharmaceutical companies, such as Pfizer, Novartis, GlaxoSmithKline and Merck, have listed subsidiaries in India to target the expanding domestic market, as well as other countries in Asia. For example, West Pharmaceutical Services plans to serve markets like Vietnam and Indonesia from India, launching a 10-year plan to build a 37,700-square-meter packaging facility in Sri City.

Domestic players include Ranbaxy, Dr. Reddy's Laboratories, Lupin, Cipla, Sun Pharmaceutical and Zydus Cadila. The average export component for these top domestic performers accounts for more than 60.0 percent of their consolidated net sales. Globalization among domestic companies is well underway as many of India's largest players are expanding into clusters outside of the region. Zydus Cadila, for example, is headquartered in Ahmedabad but is active across the United States, Europe, Japan, Brazil, South Africa and many other emerging clusters. Hyderabad-based Natco Pharma reportedly planned to rise over INR 120.3 crore (\$22.0 million)¹ to fund its expansion plans and research activities.

Industry framework

Intellectual capacity

India benefits from a well-educated, English-speaking labor force and enjoys a sizable share of chemists, all crucial components of its robust manufacturing business. In the past, low levels of academic collaboration and a shortage of high-tech, industry professionals limited the growth of R&D. Recently, this has been partially offset by an increase in the number of Indian scientists who have opted to return home from abroad. Today, different studies have estimated that the scientific talent pool of 4.0 million Indians constitutes the largest English-speaking community outside the United States.

The clinical trial business in India, running at about INR 4,500.0 crore (\$823.0 million)¹ in revenue annually, benefits from the country's large, genetically diverse and medically naive population, which means trials can be conducted quickly and at low cost compared with trials in the West. On

average, the cost to conduct a trial India is 50.0 to 75.0 percent lower compared to the United States or European Union.

Innovation capital

Historically, one of the biggest challenges for India's budding biotechnology sector was lackluster R&D investment. To meet new challenges in an open market, many Indian pharmaceutical companies are progressively increasing their R&D investment, and a few large companies are investing in New Drug Discovery Research (NDDR). Top domestic pharmaceutical players such as Ranbaxy, Dr. Reddy's Laboratories, Sun Pharma and Wockhardt are investing more than 10.0 to 12.0 percent of their revenues in R&D, up from 5.0 to 10.0 percent not so long ago. They are not far from catching up with the average 15.0 percent spent by Western pharmaceutical companies. Some companies are also scaling up via R&D collaboration with other companies.

Fiscal and political resources

Recognizing the importance of current and future states of the life sciences industry, the central and state governments have developed measures to support various aspects of the industry. On the biotechnology front, the Indian central and state governments have put competitive tax concessions in place to encourage R&D and support the formulation and distribution aspects of the value chain. In addition, they created an "abbreviated new drug application" to reduce product approval delays.

Key initiatives by the Indian government for the pharmaceutical industry include:

- Allowing 100.0 percent foreign direct investment (FDI) under the automatic route for Greenfield projects as well as for Brownfield projects in the drugs and pharmaceuticals sector, including those involving the use of recombinant technology, after government approval (Department of Industrial Policy and Promotion).
- Preparing to set up a INR 3,498.4 crore (\$639.6 million)¹ venture capital (VC) fund to give a boost to drug discovery and strengthen the pharmaceutical infrastructure in the country.
- Issuing an expression of interest for technical and financial bids needed for the selection of a global-level consultant. The consultant will prepare a detailed project report to develop India as a drug discovery and pharmaceutical innovation hub by 2020.
- Approving in principle the Drugs and Pharmaceuticals Manufacturers Association (DPMA)'s proposed Special Economic Zones (SEZs) for pharmaceuticals, bulk drugs, active pharmaceutical ingredients (APIs) and formulations to be located at Nakkapalli Mandal in Visakhapatnam District.

The Biotechnology Industry Partnership Programme (BIPP) has been launched by the Department of Biotechnology (DBT) to support high-end biotechnology research capable of generating globally recognized intellectual property. Additionally, the Biotechnology Regulatory Authority of India (BRAI) has been created, an autonomous body formed specifically to regulate the biotechnology segment and reduce regulatory overlap.

¹ Six-month average conversion rate of 54.7 Indian Rupee (INR) per U.S. dollar, as of October 2012.

In 2009, the Union Ministry of Health and Welfare, in collaboration with the pharmaceutical industry and airport developers GVK and GMR, conceptualized a plan to support the distribution channels used by the producers of generic drugs and CMOs. The measure has yet to implement the setting up of dedicated cargo zones to handle pharmaceutical imports and exports.

Price controls are carried out on certain drugs by virtue of the Drugs Price Control Order (DPCO), supervised by the National Pharmaceutical Pricing Authority (NPPA). There are talks about putting new price caps on branded drugs as well. The Indian government's Department of Pharmaceuticals has started opening medicine shops called Jan Aushadhi in various locations to sell generic medicines at lower prices than their corresponding branded medicines. About 3,000 Jan Aushadhi stores are planned for 2012 and 2013.

Outlook

According to India's Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers, the income and net sales of drugs and pharmaceuticals for the periods of 2011 and 2012 are anticipated to achieve an annual growth of about 14.1 percent and 13.5 percent, respectively. The same source projects the market to reach INR 481,000.0 crore (\$87.9 billion)¹ by 2020, whereas other analysts have valued the country's pharmaceutical market at upward of INR 273,500.0 crore (\$50.0 billion)¹ by 2020. Helping to propel this growth is strong local demand, fueled by the large population base and a growing middle class.

India has been making progress in tackling the challenges that foreign companies are likely to encounter when carrying out business in the country, such as legal infrastructure. In particular, the regulation around ownership of public companies and the management of intellectual property. Although the industry is supported by Intellectual Property Protection regime, licensing of most drugs and pharmaceutical products has ended. Manufacturers are now free to produce any drug duly approved by the Drug Control Authority, potentially hindering global players accustomed to more regulated environments. Intellectual property protection is still weak, which downgrades the attractiveness of the country.

Beyond domestic demand, the area has created a positive reputation in areas essential to the future of the life sciences industry. India already has a strong CMO base and will continue to expand this area of the industry as global companies outsource to drive margins. In addition, with the large number of drugs coming off patent, the robust generic manufacturing market is poised to take advantage of new product areas. Although the biotechnology market is still new, there is a market share to be had in the realms of biosimilars and contract research given the advancements to high-tech infrastructure and talent pool capabilities that are being made.

¹ Six-month average conversion rate of 54.7 Indian Rupee (INR) per U.S. dollar, as of October 2012.

Industry Framework Trends

Government interested in increasing biotechnology venture capital funds

Asian capital firms, most notably Chinese and Indian, are very active in the biotechnology sector both at home and abroad, with the majority focused on early-stage opportunities. Indian investment firms have also received funding assistance from overseas venture capital firms in the United States, Israel, Europe and, more recently, Japan and China. To date, the pharmaceutical sector has been less targeted by private equity investment because of the prohibitively high valuations. However, the country is actively working to attract more funding into the biotechnology sector. The Indian government is in discussion with export finance institution Exim Bank to set up an INR 2,000.0 crore (\$365.6 million)¹ venture capital fund to invest in pharmaceutical R&D.

India opens up to foreign investment

There are indications that the country will again welcome outside investments in the domestic pharmaceutical sector, with the Indian finance ministry approving roughly INR 180.0 crore (\$33.0 million)¹ in investments by foreign companies, which came on the heels of a government decision to permit foreign investors to own up to 49.0 percent of established Indian firms. Significant foreign deals include Abbott Laboratories buying Mumbai-based Piramal Healthcare's Indian business for INR 20,348.4 crore (\$3.7 billion)¹ in 2010 and Daiichi Sankyo gaining controlling interest of giant generics maker Ranbaxy Laboratories for INR 22,974.0 crore (\$4.2 billion)¹ in 2008.

The current rule allows foreign investors to start a company in India once they have obtained approval to get a share of a domestic drug company on conditions that they won't stop making the cheap drugs they currently produce and that they will keep investing in R&D with Indian partners for five years.

The Indian clinical research organization (CRO) market

Frost & Sullivan estimates that the CRO market reached INR 2,653.0 crore (\$485.0 million)¹ of revenue in 2010 to 2011 and will cross 5,470.0 crore (\$1.0 billion)¹ in 2016, growing at an 11.0 percent to 13.0 percent rate as India builds its track record, creates a favorable environment for clinical trials and gains increasing credibility as a base for global phase I-IV clinical trials.

Looking to include the country as a preferred clinical trials site for their studies, multinational CROs still dominate the market of global trials. Indian CROs and multinational pharmaceutical companies are also into global trials, whereas Indian pharmaceutical companies usually conduct local trials. The reliability of well-established CROs, emerging areas such as diagnostic research, low costs and high-standard practices are expected to drive India's CRO market. However, there still are challenges to overcome, such as quality concerns with small-scale CROs and lack of quality infrastructure in smaller tier II sites.

Andhra Pradesh

Overview

Hyderabad, certain areas of the Medak district and Vizag in the Andhra Pradesh have emerged as important biotech and pharmaceutical research and manufacturing hubs in India. Called Genome Valley, the biopharmaceutical zone spreading across several Hyderabad suburbs initiated the development of a biotech and pharmaceutical cluster. Its centers of excellence include the Centre for DNA Fingerprinting and Diagnostics, as well as the US Pharmacopeia, in addition to smaller research parks such as the IKP Knowledge Park and the Alexandria Knowledge Park. Companies such as Biological E Limited, Dr. Reddy's, Aurobindo Pharma, Pfizer, Zenotech, Vimta Labs and GVK Bio are present there. They are highly active in formulations, R&D and bulk generic manufacturing.

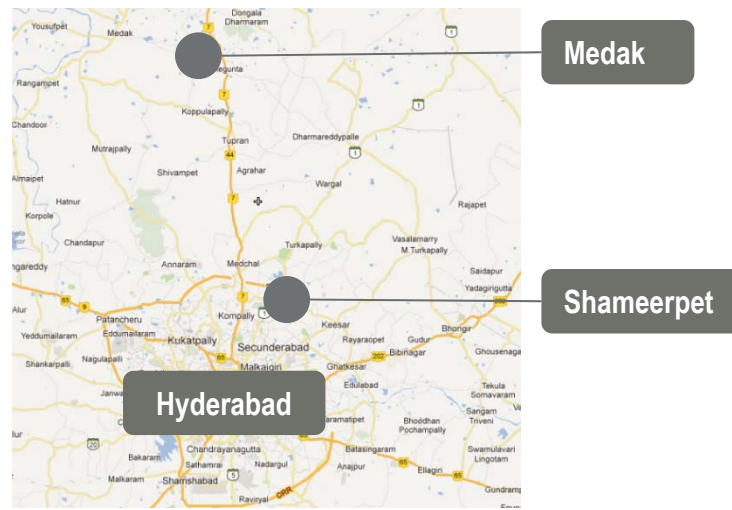
The cluster has matured as a life sciences destination catering not only to the domestic market, but with a significant export component as well, having around six Special Economic Zones (SEZs) dedicated to the life sciences, totaling nearly 300.0 hectares.

Outlook

Andhra Pradesh is expected to grow as a life sciences destination in India, given the availability of quality research and active state government support. The latter helped to develop the pharmaceutical and biotechnology industry through specific policies, promoting a knowledge-based cluster approach with financial incentives and appropriate infrastructure support. Industry-specific R&D offered by the Institute of Clinical Research and the Centre for Cellular and Molecular Biology is also expected to boost the cluster's growth.



The Shapoorji Pallonji Biotech Park, which was recently renamed Alexandria.



TWO RECENT LEASES*

Lupin (long) leased 11.0 hectares of land at INR 2,720 / sqm in JNPC, Vizag.

Granular Technologies (long) leased 4.8 hectares of land at 2,065 / sqm in JNPC, Vizag.

JNPC

Jawaharlal Nehru Pharma City (JNPC) was developed especially for pharmaceuticals, bulk drug, chemical and allied industries on 971.7 hectares of land in Vizag, with proposed investment of INR 25,000.0 crore.

PROCTOR & GAMBLE

is setting up a new plant in Mahboobnagar, near Hyderabad, on 68.8 hectares of land with proposed investment of INR 500.0 crore. The land price is around INR 1,250 per sqm of land.

UNDISCLOSED TIM

An America-based global pharmaceutical and biotech Fortune 500 company is exploring Hyderabad for setting up their manufacturing plant in around 25 hectares of land.

Andhra Pradesh has evolved as a key state in India for the life sciences industry because of its enabling environment and state-level fiscal incentives for the sector.

The Hyderabad knowledge corridor, spreading over 8,000 hectares, is envisaged as one of the leading developments in the knowledge industry, including life sciences research.

Activity key: Leasing Development Sales Tenants in the market Large blocks of space

*In India, manufacturing industries typically buy (outright or long lease) the land instead of leasing (short term) ready-built spaces. Deals quoted here are recent land deals.

Gujarat

Overview

Gujarat, with concentration in the cities of Ahmedabad, Vadodara and Ankleshwar, lists more than 1,600 pharmaceutical manufacturing licenses and more than 50 biotechnology companies. Companies in the area support a range of industry functions including bulk manufacturing, formulations and R&D for large domestic companies such as Zydus Cadila, Intas Pharmaceuticals, Claris, Alembic, Lupin, Sun Pharmaceutical and Dishma Pharma. Gujarat is a thriving industrial state and a hotbed for investment that accounts for 15.1 percent, or INR 626,315.0 crore (\$114.5 billion),¹ of the total investments (IEM+LOI+DLI) in India. Over 135 life sciences companies signed a memorandum of understanding (MoU) for investing in Gujarat during the Vibrant Gujarat Summit in 2011. Gujarat's pharmaceutical and biotech exports are supported by a pharmaceutical Special Economic Zone (SEZ) covering more than 400.0 hectares.

Outlook

Excellent infrastructure (42 ports, 14 airports and an extensive road and rail network) is expected to drive the state's industrial future. Gujarat also boasts 24 / 7 power supply and a 2,200.0-kilometer, statewide gas grid that supplies the industrial areas. Large-scale investments in the Delhi–Mumbai Industrial Corridor (DMIC), the Dholera Special Investment Region (SIR) and the Dahej Petroleum, Chemicals and Petrochemicals Investment Regions (PCPIR) are expected to put Gujarat in the driver seat of industrial development, with the life sciences sector being one of the state's focus industries.

ABBOTT*

is setting up a nutraceuticals plant in Jhagadia, 200.0 km south of Ahmedabad. Lease is at INR 820 per sqm of land.

TEVA / P&G JV

is setting up a new OTC plant on 15.8 hectares in Sanand GIDC. Asking price was at INR 3,225 per sqm of land.

SANAND GIDC

Developed on an area of 1,500.0 hectares in Sanand for integrated industrial purposes.

BIOCON, LTD.

The Indian biotech major is debating investing nearly INR 3.0 billion to set up a plant in Gujarat.

Excellent physical infrastructure, proactive government support and an attractive business environment have made Gujarat the fastest-growing state for industrial investment. Several large-scale industrial developments are planned, such as a Special Investment Region at Dholera and a SEZ at Dahej.

*In India, manufacturing industries typically buy (outright or long lease) the land instead of leasing (short term) ready-built spaces. Deals quoted here are recent land deals.

Maharashtra

Overview

Maharashtra accounts for 18.4 percent of the country's output of pharmaceuticals by value, according to the Maharashtra Industrial Corporation (MIDC). Mumbai, Pune, Nashik and Aurangabad are the state's major life sciences hubs, with over 3,100 pharmaceutical manufacturers registered in these areas. Maharashtra positions itself as the top destination in India for the pharmaceutical sector, with a strong presence across nearly the full spectrum of the value chain including active pharmaceutical ingredients (APIs), formulations, bulk manufacturing and R&D. Global industry players with facilities in the state include GlaxoSmithKline, Johnson & Johnson, Pfizer, Abbott, Alkem, Bayer, Aventis and Baxter. As India's leading producer of vaccines in India, the state is also a major export hub, with an area of more than 600.0 hectares designated as a Special Economic Zone (SEZ) to promote export in the life sciences sector. Availability of skilled manpower, excellent research environment, diverse feeder stock and investor-friendly policies have made Maharashtra a breeding ground for newer domains in new chemical entities (NCEs), clinical research, contract manufacturing and biosimilars.

Outlook

Being the frontrunner in terms of economic contribution, Maharashtra has the advantage of being easily accessible by all international markets. Academic and industry R&D joint ventures (Indira Gandhi Institute of Development Research, Indian Institute of Chemical Technology and MGM Institute of Health Sciences) are expected to drive the life sciences cluster's growth.

¹ Six-month average conversion rate of 54.7 Indian Rupee (INR) per U.S. dollar, as of October 2012.

2.4 HECTARES*

2.4-hectares land parcel leased for INR 1,480 per sqm in Shendra MIDC at Aurangabad for an unnamed pharma company.

NIPRO MEDICAL CORPORATION

purchased 8.9 hectares of land at Khopoli.

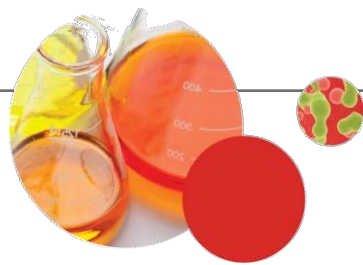
INSPIRA INFRA

is developing a state-of-the-art industrial park for life sciences industry in nearly 101.0 hectares of land in Aurangabad.

UNDISCLOSED TIM

An America-based global pharma leader is looking for around 45,000 sqm of office space in Mumbai.

Maharashtra is the frontrunner of economic development in India with a 21.0 percent contribution to the national industrial output. Large-scale infrastructure developments like the Navi Mumbai Airport, the Delhi–Mumbai Industrial Corridor and the National Industrial Manufacturing Zone are expected to put the state on a high-growth trajectory.



Reflecting the rising disposable incomes of the population, Indonesia's pharmaceutical market has seen double-digit growth since 2009 and is anticipated to rank as the sixth largest pharmaceutical market in the region by 2016.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Indonesia market overview

The country's share in the Southeast Asia pharmaceutical market is already around 37.0 percent. The Indonesian government and IMS Health estimate the total pharmaceutical GAGR at 12.7 percent from 2009 to 2014. This is higher than the average annual 3.0 percent growth estimated for the global pharmaceutical industry.

The market is estimated to reach IDR 46.2 trillion (\$4.9 billion)¹ by year-end 2012 (estimate to be a 10.0 to 12.0 percent year-over-year growth) according to the Indonesian Pharmaceutical Association, GP Farmasi. This is a relatively small market value for a country with 240.0 million

people and partly due to low drug consumption per capita, when compared to neighboring countries, as many Indonesians have to pay out-of-pocket for a majority of their medical bills. According to a Ministry of Health source, only around 3.0 to 5.0 percent of the population take medicines.

The sector has also so far been held back by the following: a lack of local raw materials, leaving producers at the mercy of fluctuating global prices and high import tariffs; a slow bureaucracy; the lack of intellectual property protection (some estimates report counterfeit products make up as much as 20.0 percent of the overall market); regulatory barriers against international investment; high distribution costs resulting from poor infrastructure; and a lack of innovation.

However, these deterrents are offset by inexpensive production and labor, an increasingly attractive attribute for foreign investors. Furthermore, the Indonesian government treats healthcare as a top priority and intends to double its healthcare expenditure to around 5.0 percent of GDP by 2014. Economic prospects and changes in lifestyle, coupled with the sheer size of the population, make the Indonesian pharmaceutical market attractive.

The majority of pharmaceutical manufacturers are located in Java. More than 240 domestic companies account for 63.0 percent of the market share, roughly 40 foreign-owned companies hold a 30.0 percent market share and four state-owned companies comprise the remaining 7.0 percent.

¹ Six-month average conversion rate of 9,430.46 Indonesian Rupiah (IDR) per U.S. dollar, as of October 2012.

Industry statistics

0.2 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students

21.7%

0.1% Gross expenditure on R&D, as percent of GDP

The eight biggest local companies are Sanbe Farma, Kalbe Farma, Dexa Medica, Bintang Toedjoe, Tempo Scan Pacific, Kimia Farma, Konimex, Phapros and Indofarma. The leader, Kalbe Pharma, is Southeast Asia's largest publically listed pharmaceutical company with a market capitalization of IDR 37.7 trillion (\$4.0 billion).¹ The company dominates the OTC market with an estimated 14.0 percent share of the overall pharmaceutical market. Kalbe is preparing for the expansion of Indonesia's market and expects to achieve IDR 46.0 trillion (\$4.9 billion)¹ in 2012. After opening a new generic plant in Cikarang in 2011 to increase production capacity by 30.0 to 50.0 percent, the company plans to open new distribution centers in Medan, Palembang and Makassar in addition to the centers it currently has in Jakarta and Surabaya. Kalbe setting aside IDR 100.0 billion (\$10.6 million)¹ a year for R&D. Combiphar, another domestic player, is also boosting R&D and upgrading its plant to meet higher global standards and make its products exportable.

Although the market is already concentrated with the top 20 companies accounting for 80.0 percent of the total production, press reports point to further consolidation. Cash-rich Kalbe Pharma is said to be in talks with several pharmaceutical companies in Indonesia to build up its domestic consumer health and nutritional businesses.

The majority of the local pharmaceutical companies achieved better sales growth in the past couple of years. This growth was supported by improved macro-economic conditions and stable raw material import prices. This is an important factor because it is estimated that Indonesian companies import close to 95.0 percent of the pharmaceutical raw materials needed, mainly from China, and to a much smaller extent, from India and Europe. Both government and industry players aim to reduce dependence on imports for pharmaceutical basic material to only 20.0 percent by encouraging and boosting domestic production, but the trend has not reversed yet and imports are forecasted to reach IDR 11.4 trillion (\$1.2 billion)¹ in value in 2012 (an 8.5 percent increase).

The country's exports of pharmaceutical products are very limited, with more than 75.0 percent of locally produced drugs consumed domestically, but they may increase thanks to terms of the ASEAN Free Trade Area (AFTA) and adherence to Good Manufacturing Practice (GMP) standards by more domestic producers.

Pfizer, Bayer and GlaxoSmithKline collectively hold about 8.0 percent of the market, a very small share due to a series of entry barriers. A large growing population, combined with low affluence levels (today, only the middle and upper income markets can afford costly, branded drugs), warrants different market penetration tactics in Indonesia. Unlike start-ups and technology vendors, which still focus on China and India, large multinationals have different views on emerging markets where they are more willing to scout for local partners.

In September 2012, Merck Sharp and Dohme (MSD) opened a IDR 198.0 billion (\$21.0 million),¹ 4,900-square-meter facility in Pandaan, Pasuruan, East Java, to manufacture packaging for cardiovascular, hypertension, respiratory, oncology and diabetes drugs, among others – about a quarter of which will be for domestic consumption and the rest for exports.

Ownership is limited to 75.0 percent for foreign investments and regulation 1010/2008 obliges foreign companies to set up local manufacturing operations. However, the government recently announced a plan to allow a 100.0 percent foreign ownership of drug firms, resulting in increased overseas investment, and indirectly in higher volume, and quality of local production.

Industry framework

Intellectual capacity

One of the issues hampering the development of the pharmaceutical sector in Indonesia is the lack of skilled labor and trained staff, particularly at the PhD level, but some projects exist to forge more scientific collaborations between Indonesian and foreign researchers. In July 2011, Indonesia received a IDR 10.4 billion (\$1.1 million)¹ research grant through a new USAID project to invest in biodiversity-related projects; it is open to Indonesian scientists participating in the United States National Science Foundation research projects with U.S. scientists.

Innovation capital

Product development by domestic companies has so far overwhelmingly relied on foreign licenses or on expired patents. For foreign companies, high production costs combined with low selling prices squeeze profits and leave less cash available for R&D. However, the domestic pharmaceutical industry is looking to expand production and R&D capacity as several areas of opportunity exist:

- As income rises, consumers begin to demand higher quality, thus encouraging local drug companies to innovate.
- The wide variety of tropical diseases could make Indonesia suitable for some R&D activities in this field.
- Herbal medicine ("jamu") is one area where Indonesia could create a competitive advantage, given the increased interest and growing imports of alternative medicines in Western countries. Raw material is abundant (30,000 of the 40,000 of available medicinal plant species are found in Indonesia) and the Ministry of Health ensures jamu is safe and backed up by research.
- The government would like the country to become a global hub for Halal-labeled products.

Fiscal and political resources

The pharmaceutical industry will benefit from healthcare becoming a top priority for the government, evidenced by its intention to double healthcare expenditures to 5.0 percent of GDP by 2014 and to increase by 26.0 percent the 2011 healthcare budget allocations. Indonesia's government is committed to addressing pharmaceutical sector challenges. Indonesia will continue to represent a high reward but high risk pharmaceutical market for Western multinationals to operate in, on account of its deficient regulatory and intellectual property rights (IPR) enforcement regime, price cuts of branded generics, a new import tax imposed on raw materials for drug manufacturing and long registration procedures. Also posing a challenge is the inclusion of Indonesia in the United States Trade Representative's Special 301 Priority Watch List in 2011 due to the prevalence of counterfeit pharmaceuticals.

¹ Six-month average conversion rate of 9,430.46 Indonesian Rupiah (IDR) per U.S. dollar, as of October 2012.

Industry Trends

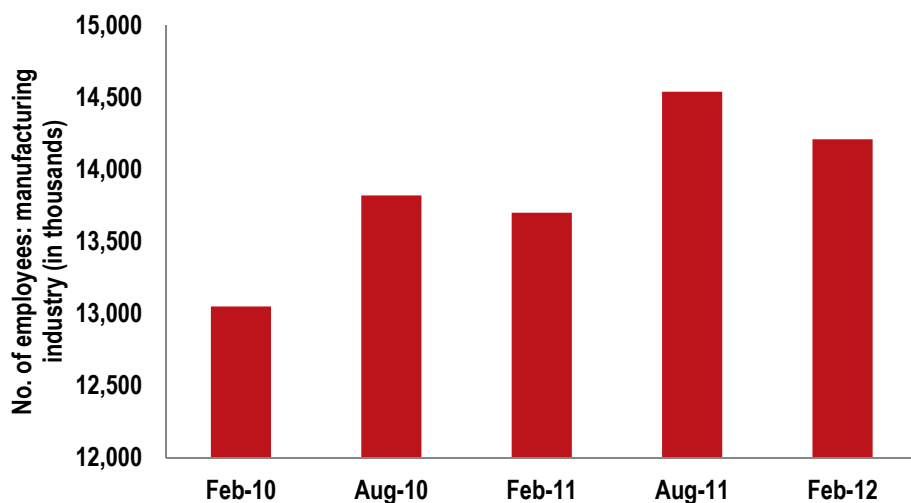
Jamu: From traditional herbal products to an Indonesian brand

Traditional medicines are used by 80.0 percent of the population in Africa and Asia, reports the World Health Organization (WHO) and, in Indonesia, nearly half of adults consume jamu, a traditional medicine, according to a 2010 study by the Health Ministry. Jamu products are starting to be used in pediatric remedies for cough, cold and allergy and have continued to grow in popularity in 2011. Affiliates to the Association of Indonesian Jamu Producers (GP Jamu) collectively employ 3.0 million people at 1,300 factories, and report an annual turnover of IDR 10.0 trillion (\$1.1 billion).¹

In 2011, Indonesia had only six phyto-pharmaceutical herbal medicines with clinically proven effectiveness, plus 38 standardized herbal medicine in the preclinical trial phase, all of them integrated into existing healthcare services. The country is facing a public health issue with the distribution of counterfeit, poor quality or adulterated herbal medicine, hence the importance of the “Certification of Phytopharmaca” delivered by the Indonesian National Agency for Food and Drug Administration (FDA). Dexa Medica was among the first companies to receive this certification for their herbal products.

¹ Six-month average conversion rate of 9,430.46 Indonesian Rupiah (IDR) per U.S. dollar, as of October 2012.

Employment



Source: Statistics Indonesia

However, the Indonesian Health Ministry's focus on improving the country's regulatory and business environment encourages multinational drug makers to set up local manufacturing operations:

- A signatory to the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) has led to an improvement in patent protection—extending the term of protection from 14 to 20 years—and the introduction of the reversal of the burden of proof onto the defendant in intellectual infringement cases.
- The introduction of Good Manufacturing Practices (GMP) as well as the ASEAN Common Technical Dossier and requirements will also encourage local companies to increase quality standards.

Outlook

Domestic demand for low cost drugs is likely to increase. With increased spending on healthcare, a growing population and rising incidence of chronic diseases, Indonesia is among the 17 “pharmerging markets” where IMS Health expects double-digit increases through 2015. The country's huge generic drugs sector is likely to see consolidation, but will remain challenging as long as part of it is cannibalized by counterfeit drugs. The steady growth of health supplements and OTC medication is expected to continue, buoyed by increased self-medication, accessibility to more affordable drugs and the 2014 roll-out of a health insurance scheme covering basic healthcare for all Indonesians.

Steady projected sales growth provides substantial incentives for companies to operate in the country, and the main challenges to investment in Indonesia are easing. Manufacturing standards are improving and government reforms are underway, such as efforts made to better protect intellectual property rights in order to encourage investment. For companies facing post-loss of exclusivity (LoE) issues, Indonesia is one of the APAC countries offering opportunities for volume plays. For example, Sanofi-Aventis recently launched a second, cheaper brand of platelet-lowering product to defend its market share against further generic erosion in Indonesia.

Although the Indonesian pharmaceutical market is largely import driven, exports are likely to increase as more domestic producers adhere to Good Manufacturing Practice (GMP) standards. Additionally, in light of efforts to improve Indonesian pharmaceutical regulations and Good Clinical Practice (GCP) standards, the country is becoming an increasingly attractive location for clinical trials, especially in Java Island. Change in legislation will give the industry renewed growth, and allowing 100.0 percent Foreign Direct Investment in Indonesia will attract foreign pharmaceutical companies. The healthy number of mergers and acquisitions and the rationalization of operations that we are starting to see hint that a shift is about to take place in the sector as companies are well aware of Indonesia's potential.

Jababeka Industrial Estate

Greater Jakarta Industrial Estate

Although Indonesia has about 55 industrial park firms providing land and services, none are wholly dedicated to the life sciences industry. However, Java is seen as a choice destination and contains 75.0 percent of the country's industrial estates. The province of West Java contains about 50.0 percent of all industrial estates countrywide. This includes Bekasi and Karawang, located within the Jakarta metropolitan area. Called the Greater Jakarta Industrial Estate, this area that covers Tangerang, Bogor, Bekasi and Karawang is where most of the biggest pharmaceutical companies are located.

Many big pharmaceutical companies are located at Jababeka Industrial Estate, Pulo Gadung Industrial Estate (JIEP) and Bogor industrial zoning area. In Bogor, for example, PT Bayer Indonesia has a pharmaceutical products plant in Cibubur and is investing IDR 200.0 billion (\$21.1 million)¹ to enhance another production capacity of OTC pharmaceuticals in Cimanggis. Both plants market products in the country and also export to other Asia Pacific countries.

Jababeka Industrial Estate

Spanning 1,570 hectares of land, the Jababeka Industrial Estate is located at Cikarang, Bekasi Regency, 31.0 kilometers away from Jakarta City. Described as the first modern Indonesian eco-industrial estate, the Jababeka Industrial Estate was jointly developed with ProLH GTZ under a technical cooperation program between Indonesia and Germany. Jababeka Industrial Estate is meant to be a comprehensive, one-stop industrial development solution, offering industrial land as well as build-to-suit factory buildings. Its Cikarang Dry Port provides cargo handling and logistics for international export and import. Jababeka has its own medical city and is home to many renowned international and domestic enterprises such as Dexa Medica and AstraZeneca.

Outlook

Jababeka plans expansion as demand surges. The nearby Medical City has the ambition of becoming the premier location for scientific research in Indonesia. Jababeka's ongoing projects include a 130-megawatt power plant worth IDR 1.1 trillion (\$141.0 million)¹ and a new seaport near the area.

¹ Six-month average conversion rate of 9,430.46 Indonesian Rupiah (IDR) per U.S. dollar, as of October 2012.



LEASING ACTIVITY

The industrial leasing market in Jababeka remained quiet in 2012. The average asking rental price for a factory or warehouse in Jababeka is around IDR 38,000 per sqm per month.

MEDICAL CITY

A medical city is to be built on 72.0 hectares of land in Jababeka. 10 hectares are apportioned for hospital, 5 for research labs, and the rest for student dorms, a hotel, pharma companies and the President Univ. School of Medicine.

JABABEKA

sold 19.0 hectares of land with a value around IDR 329.0 during Q1 2012. This represents an increase of 34 percent in revenue compared to the same period in 2011. No pharmaceutical company entered during this period.

KIMIA FARMA (KAEF)

signed a joint venture agreement with Tianjin Pharmaceutical Group Co., to set up an injection corticosteroid plant in Cikarang, West Java. The plant is scheduled to begin operations in 2014.

Compared with other industrial parks, Jababeka has the most complete facilities and is the most convenient for drug approval procedures. The park's leading status will be reinforced by the proximity of the Medical City to be built on a 74-hectare property in Kota Jababeka.

Activity key:

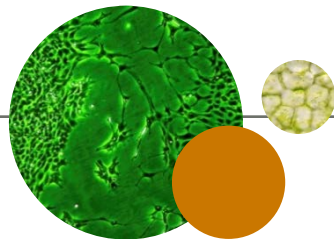
Leasing

Development

Sales

Tenants in the market

Large blocks of space



A leading importer of prescription drugs, Japan presents global life sciences industry players with a large market, ranking number 2 in consumption of prescription drugs, behind the United States. As a manufacturing country, Japan is industrialized well ahead of other Asian countries and its pharmaceutical groups produce a large range of drugs, although in comparatively small quantities and with some degree of reliance on overseas research.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Japan market overview

A large middle class, massive wealth and an aging population make Japan an attractive long-term destination for pharmaceutical companies. Japan's pharmaceutical industry (including manufacturing, wholesale and retail) is one of the world's largest with an annual shipment of more than JPY 7.0 trillion (\$88.7 billion).¹ Imports rose 9.3 percent to JPY 2.5 trillion (\$31.7 billion)¹ in 2011, led by "ethical" (prescription) drugs.

Since 1990, important regulatory reforms created a conducive environment for domestic pharmaceutical companies to expand their overseas operations and thus become more globalized. In particular, the country made its industry regulations match closely with those in developed Western countries, facilitating not only Japanese players to develop in foreign markets, but also American and European counterparts to operate in its domestic market.

Japan's production of pharmaceutical products reached JPY 6,987.4 billion (\$88.5 billion)¹ in 2011, an increase of 3.1 percent year-over-year. Prescription drugs made up the bulk of production at JPY 6,344.5 billion (\$80.4 billion),¹ according to the Ministry of Health, Labor and Welfare. For the full 2012 year, the domestic market is expected to grow more moderately, owing to downward pressures on drug prices and to a shift to generics.

Exports are mainly to the United States (JPY 60.0 billion, or \$760.0 million¹), followed by China (JPY 18.4 billion, or \$233.0 million¹) which recently leapfrogged South Korea into second place. Shrinking by 4.2 percent to JPY 138.4 billion (\$1.8 billion)¹ in 2011, exports are expected to continue stagnating due to patent expirations and the forecasted 25.0-percent drop in U.S. sales by 2017.

¹ Six-month average conversion rate of 78.95 Japanese Yen (JPY) per U.S. dollar, as of October 2012.

Industry statistics

10.5 Researchers in science, per thousand total employment

Graduate students in science, engineering manufacturing & construction, as a % of total graduate students **21.9%**

3.4% Gross expenditure on R&D, as percent of GDP

Total patent applications, residents only **290,081**

Deregulation and generic drug alternatives have significantly increased competition between domestic and foreign pharmaceutical companies, intensified consolidation and boosted acquisitions that transformed Japanese companies from mostly domestic players to multinational groups with strong overseas sales.

Takeda is by far the largest of Japan's big nine pharmaceutical producers in terms of sales. Other top manufacturers include Astellas, Daiichi Sankyo and Eisai. In the past five years, Mitsubishi Tanabe Pharma, Dainippon Sumitomo Pharma, Kyowa Hakko Kirin Company, Shionogi & Co Ltd and Otsuka have achieved the biggest growth rates among domestic pharmaceutical establishments. Recent domestic projects include Asahi Glass, investing JPY 800 million (\$10.1 million)¹ in a new production line, doubling its Tafluprost active pharmaceutical ingredient (API) capacity at its Obama site, in addition to its Chiba plant. The new facility is scheduled to enter service in March 2013.

Due to fierce competition and climbing R&D costs, large Japanese companies such as Takeda and Daiichi Sankyo relocated part of their operations overseas. Takeda, for example, has set up operations in several Asian countries such as India, China, Indonesia and Singapore. Japanese firms have primarily focused on Western companies when undertaking overseas mergers and acquisitions. For example, Astellas purchased U.S. drug maker OSI Pharmaceuticals for JPY 315.8 billion (\$4.0 billion)¹ in 2010 to gain long-sought access to cancer treatment and to the U.S. market. In 2011, Takeda wrapped up a JPY 1.1 trillion (\$13.7 billion)¹ mega-deal to buy Swiss drug maker Nycomed.

Among foreign pharmaceutical firms in Japan, Pfizer is the leader and ranks second in Japan after Takeda, with a 5.6 percent market share in 2011. Also in the country's top 10, Roche and Novartis (both ranking number 5 with a 4.4 percent market share) and Merck (ranking number 9 with 3.7 percent) are all poised to take advantage of dynamism of the market and of profit margins higher than those recorded in other Asian countries. Pfizer increased Japanese sales to JPY 576.0 billion (\$7.3 billion)¹ in 2011, beating the market rate of 6.9 percent. GlaxoSmithKline's sales in Japan jumped by 28.0 percent in 2011 and in first quarter 2012, marking it the fastest-growing among large drug producers. With substantial growth ambitions and drug approval targets, Merck and Novartis aim to reach the top three, and Eli Lilly, the top 10. By merging its Japan subsidiaries Taiyo Pharmaceutical Industry and Teva-Kowa Pharma, Israel's Teva Pharmaceutical Industries is creating a new company with sales of approximately JPY 70.0 billion (\$886.6 million),¹ equal to Japan's largest generics manufacturer Nichi-Iko.

New drug launches have increased due to regulatory reforms and loosening pricing policies by the government. In July 2012, Japan approved a series of products, such as Merck's HPV vaccine Gardasil, AstraZeneca's stomach drug Nexium and GlaxoSmithKline's rotavirus-beating Rotarix.

Japan's biotechnology market is one of the world's largest and a key contributor to the Japanese economy, having received tangible support from the government and scored many achievements in various fields, such as gene analysis, genetic recombination and bioinformatics. Meanwhile, Japan's generics market is the sixth largest worldwide, and is still growing. Currently generic drugs make up

23.0 percent of the market, the cost-conscious government hopes to increase that share to 30.0 percent by March 2013. As such, Pfizer and Mylan are preparing to increase their share of the branded generics market with a deal to make and sell 350 of their off-patent drugs there. The OTC pharmaceuticals market generated revenues of JPY 1.0 trillion (\$13.0 billion)¹ in 2010, representing a moderate 2006 to 2010 CAGR of 1.7 percent. A third of sales are generated by the lucrative segment of traditional medicines. The 2010–2015 CAGR is expected to slow down to 1.5 percent, with a market value of JPY 1.1 trillion (\$14.0 billion)¹ by year-end 2015. Vaccines are an underdeveloped, but expanding, segment of the overall market. The government has introduced preferential measures and subsidies to revive the manufacturing of vaccines in Japan. Several large Japanese manufacturers, such as Takeda, have already taken advantage of the incentives to launch vaccine production. Supported by its Nycomed acquisition, Takeda plans to increase the scale of its vaccines operations with the launch in 2012 of a global vaccines division.

Pharmaceutical distribution in Japan remains largely dominated by large wholesalers. Intense consolidation has reduced the number of players in the past decade by 70.0 percent to about 120 distributors. The top four wholesalers, Medipal, Alfresa, Suzuken and Toho, held a 90.0 percent share of overall Japanese pharmaceutical distribution market in 2011.

Common drugs are frequently introduced in Japan market by partnerships such as the following. Several examples include: GlaxoSmithKline and Daiichi Sankyo's 50 / 50 joint venture to distribute new vaccines in Japan; Novartis' 2011 agreement with Eisai to distribute three lung drugs; Shire's commercialization of ADHD drugs with Shionogi; and Pfizer's license granted to Astellas Pharma to make and sell its Lipitor cholesterol drug in Japan. In August 2012, Takeda Pharmaceutical signed an exclusive distribution deal with Johnson & Johnson K. K. Consumer Company to market seven OTC brands. After Takeda Pharmaceutical stops distributing 13 Pfizer drugs at year-end 2012, Pfizer will begin selling them on its own. GlaxoSmithKline is also seeking direct access to its market with a recent investment in a new call center in Okinawa where pharmacists will respond to requests from medical professionals as well as consumers.

Industry framework

Intellectual capacity

Most top Japanese universities have a life sciences–related faculty, which trains future medicine professionals and undertakes various academically oriented R&D programs with leading Western counterparts. Japan's workforce is also strengthened by those Japanese nationals who possess overseas education and research experience. Japan's pharmaceutical industry underwent a fast and steady development course after World War II, with a push on research starting in the 1990s. That shift generated more laboratory-based cooperation between Japanese researchers and foreign scientists and more participation in collective and cross-border projects.

Innovation capital

The Japanese government has designated a few locations to lead the development of the life sciences industry, where selected projects are eligible for government funding. Kobe Biomedical Innovation Cluster is the most important of these projects and is profiled in this report. Another one

¹ Six-month average conversion rate of 78.95 Japanese Yen (JPY) per U.S. dollar, as of October 2012.

is Tsukuba Science City, located 60 kilometers northeast of Tokyo and covering an area of 28,400 hectares. In its center, a Research and Education District covers about 2,700 hectares and includes national research and educational institutes, as well as a residential area with parks. The suburban district covers about 25,700 hectares where systematic urbanization is promoted, the natural and rural environment is preserved and private research institutes are located. A new urbanization area along the Tsukuba Express Line is also under development.

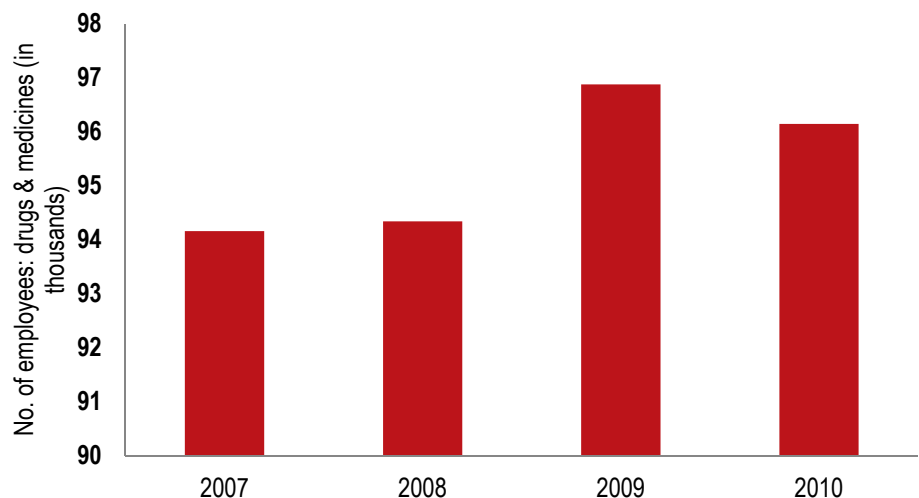
Beyond government initiatives, industry associations such as the Pharmaceutical Industry Forum (PI Forum) are active in trying to rev up R&D activities in Japan. Such initiatives are encouraging for domestic R&D hubs. The Kobe and Tsukuba science parks have fallen on hard times of late and have been struggling to attract occupiers as much of the R&D activity has moved offshore in recent years.

Fiscal and political resources

The Ministry of Health, Labor and Welfare (MHLW) and the Pharmaceuticals and Medical Devices Agency (PDMA) are the key regulators in Japan. In August 2012, a bill was submitted to create an independent inspection organization within the MHLW to evaluate pharmaceutical administration and monitor how safety policies relating to pharmaceutical products and medical devices are implemented in the country.

Over the past decades, the government adopted a series of measures aimed at developing Japan's pharmaceutical industry and enhancing its competitiveness. In recent years, Japan recognized the need for having a national strategy for the development of its biotechnology industry to meet increasing market demand, as well as produced Biotechnology Strategy Guidelines.

Employment



Source: Japan Ministry of Economy, Trade and Industry

Highlights

Japanese life sciences firms expand globally

Japanese firms have, in recent years, engaged in intense acquisition activity in Asia and globally, failing, however, to capitalize on their geographic proximity to China. Here are some of the most significant transactions by Japanese companies looking to expand their presence overseas.

- In August 2012, Nipro Pharma Corporation started building a JPY 19.7 billion (\$250.0 million)¹ pharmaceutical plant on a site of 150,000 square meters in Vietnam-Singapore Industrial Park (VSIP) in Vietnam's northern port city of Haiphong. Scheduled for completion in April 2015, the factory will provide high-quality medicines and medical equipment for Japan, Europe and the United States, and is expected to bring in net revenue of JPY 200.0 billion (\$2.5 billion)¹ by 2020.
- Fuji Pharma is taking over OLIC, Thailand's largest contract pharmaceutical manufacturer, to utilize it as a manufacturing and distribution base for Fuji Pharma products in Asia and globally, in line with the company's "Good to Great" medium- / long-term vision for 2015 to grow overseas.
- Bio-tech firm Chugai Pharmaceutical plans to invest JPY 12.6 billion (\$160.0 million)¹ on antibody research in Singapore from 2012 to 2017, opening its JPY 94.7

million (\$1.2 million)¹-Chugai Pharmabody Research Institute, its second satellite research institute and Singapore's first corporate laboratory in antibody engineering.

- In April 2012, Eisai Pharmaceuticals opened its regional offices at Dubai Healthcare City to market oncology and neurology treatment in the Middle East and North Africa region.
- After its JPY 1.1 trillion (\$14.0 billion)¹-purchase of Nycomed (Switzerland) and its JPY 631.6 billion (\$8.0 billion)¹-purchase of Millennium (United States), Takeda Pharmaceutical Company agreed in April 2012 to buy URL Pharma (United States) for JPY 63.2 billion (\$800 million),¹ plus potential further payments based on the company's performance. The deal will allow Takeda to increase its presence in the United States and contribute net sales of about JPY 43.4 billion (\$550.0 million)¹ for 2012, thanks to URL Pharma's major product Colcrys, a treatment for gout.
- In March 2012, Asahi Kasei had acquired U.S. healthcare equipment maker Zoll Medical for JPY 173.3 billion (\$2.2 billion).¹
- In 2012, Dainippon Sumitomo Pharma purchased United States biotechnology company Boston Biomedical to gain access to its oncology innovative pipeline and use its drug discovery and development platform to expand their presence in cancer treatment globally.

¹ Six-month average conversion rate of 78.95 Japanese Yen (JPY) per U.S. dollar, as of October 2012.

Japan has made its industry regulations match with those in developed Western countries, facilitating not only Japanese players to develop in foreign markets, but also American and European counterparts to operate in its domestic market. In 2012, the government considered allowing consumers to purchase drugs and medical devices already accepted in the West, but still undergoing clinical trials in Japan. Efforts have also been made to speed up the approval process for Japanese patients to gain access to better treatment, so as to cut healthcare costs for its rapidly aging society.

Many manufacturers of drugs and medical devices maintain their headquarters in Tokyo or Osaka while locating manufacturing plants and R&D laboratories in regional cities. Several local authorities promote the development of medical care and welfare services and government-sponsored special zones include policies to develop specific regions to make industry more competitive in the global market. In 2011, International Strategic Comprehensive Special Zones were created where designated companies will receive favorable tax and regulations conditions.

- Tsukuba international special zone focuses on the development and application of boron neutron capture therapy.
- Keihin waterfront district life innovation international special zone facilitates fast approval for drugs and medical devices through international collaboration in clinical trials.
- Kansai innovation international special zone accelerates the application process through R&D. The Pharmaceutical Affairs Law (PAL), which regulates the manufacturing, marketing and distribution of pharmaceutical drugs and medical devices in Japan, makes it difficult for foreign manufacturers to set up base in Japan on their own. Japanese pharmaceutical companies with ties to foreign drug makers are accelerating their efforts to introduce new cancer drugs in the domestic market by simultaneously conducting clinical tests in Japan, the United States and Europe.

Another challenge for foreign pharmaceutical firms is that clinical tests often take longer in Japan as only large medical institutions in major cities are permitted to conduct them, forcing foreign companies to test and launch new drugs first in the United States and Europe rather than in Japan where product launches could be delayed by as much as three years. The MHLW is now revising the clinical testing process and plans to allow hospitals in smaller cities to conduct clinical tests as well.

In July 2012, the government approved a regulatory reform increasing the number of countries and products benefiting from the Japan–European Community Mutual Recognition Agreement (MRA), a framework that simplifies import procedures and provides for mutual acceptance of the results of Good Manufacturing Practice (GMP) inspections at pharmaceutical manufacturing facilities. The current agreement applies only to chemical pharmaceuticals. By the end of 2012, a revised plan will reduce the cost of trade for companies producing a broader range of medicinal products and allow for the omission of certain GMP inspection procedures.

One defining characteristic of the Japanese pharmaceutical market resides in the revision of drug prices every other year by NHI (National Health Insurance). Drug retail prices are fixed and controlled by the government, but wholesale prices depend on negotiations between manufacturers and wholesalers, and pharmacy margins depend on negotiations between wholesalers and pharmacies. After the 2010 NHI revision, many players in the supply chain suffered losses and had to compromise on profit margins.

Outlook

Thanks to the regulatory reforms speeding up new drug launches, eased pricing policies and the aging population strengthening demand for drugs, sales in Japan have been growing fast at a time when other regions are suffering. With a 1.0 to 4.0 percent annual growth, pharmaceutical sales are expected to reach upward of JPY 8.3 trillion (\$105.0 billion)¹ by 2016, according to IMS Health. At this date, Japan is likely to be overtaken by China and to rank as the third largest pharmaceutical market in the world, and the second in Asia Pacific.

Demand for pharmaceuticals in Japan will be driven by the country's growing elderly population. Estimates predict the elderly population to represent over 25.0 percent of the population by 2016 (the largest percentage in the region), thus it is expected to significantly impact the government's healthcare budget, ranking as the country with both the second highest total health expenditure and second largest per capita health spending in the region. This will not be enough to compound the lower single-digit CAGR of the domestic pharmaceutical market. Japanese companies are actively seeking growth by expanding into new markets in the Asia Pacific region, as well as globally.

¹ Six-month average conversion rate of 78.95 Japanese Yen (JPY) per U.S. dollar, as of October 2012.

Kobe Biomedical Innovation Cluster (KBIC)

Overview

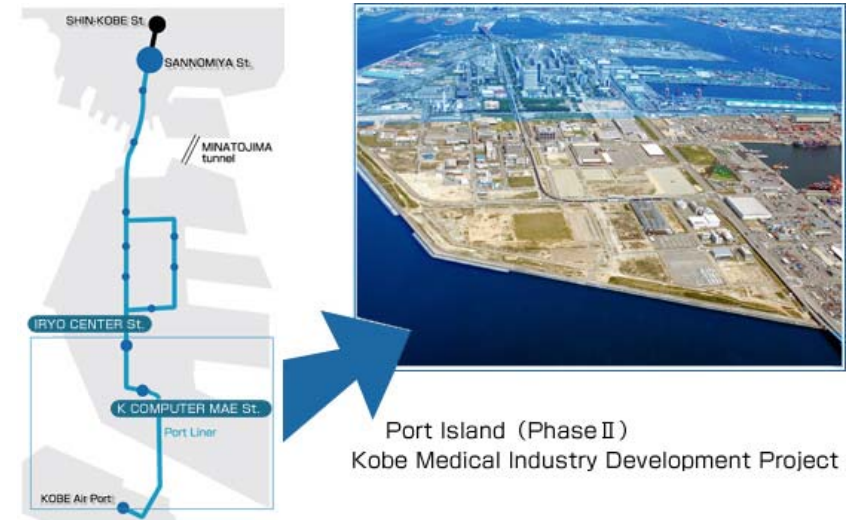
Kobe launched the Medical Industry Development Project in 1998, constructing a base of R&D activities for advanced medicine on the city's Port Island. The medical industry cluster is meant to facilitate interaction and collaboration between public institutions, academia and industry players.

At present, 11 core research facilities, such as the Institute of Biomedical Research and Innovation (IBRI), Riken Center for Developmental Biology (CDB) and Riken Molecular Imaging R&D Center, are operating in KBIC. New facilities are being added, including the Riken Next-generation Supercomputer R&D Center and new Kobe City General Hospital.

Over 200 world-class research facilities and private companies are engaged in translational research in regeneration medicine, in the pursuit of new scientific discovery for therapeutic agents and in the development of new medical instruments. The Kobe Medical Industry Development Project is regarded not only as a municipal enterprise for local development, but also as a national project for Japan.

Outlook

KBIC has granted tax exemptions, allowance for some of initial investment and financial support to invite prospects. However, with KBIC belonging to the public sector, rents tend to be non-negotiable.



KBIC is Japan's best example of an international medical zone where various incentives are provided to tenants.

Source: photos and map www.kobe-lsc.jp

Tsukuba Science City is located in Ibaraki Prefecture, 50 kilometers from Akihabara in Tokyo and 40 kilometers from Narita International Airport; and it is easily accessible from Tokyo, due to a high-speed rail transportation system. Founded by the merger of three towns and a village, the purpose-built city was inspired by planned metropolises such as Brasilia with the goal to stimulate scientific discovery in an international environment.

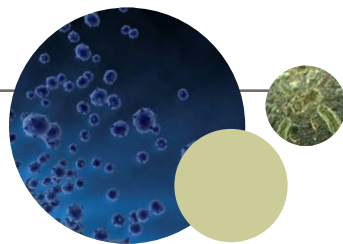
The "Research and Education District" was designed and developed to combine research and educational organizations with residences and public facilities on an area of about 2,700 hectares in area. As a result of relocation and new establishment, Tsukuba Science City is home nearly a third of Japan's public research institutions. The most prominent of these include the University of Tsukuba, the High Energy Accelerator Research Organization (KEK), the Electrotechnical Laboratory, the Mechanical Engineering Laboratory and the National Institute of Materials and Chemical Research.

Aiming to become Japan's flagship science and technology hub, Tsukuba Science City has received nearly half of Japan's public R&D budget over the past several decades and has succeeded in being one of the world's key sites for public-private partnerships (PPP) in basic research in areas such as microbiology, next-generation cancer therapy and plant genetics. Tsukuba Center, Inc. (TCI) provides various rental laboratories and offices, promotes industry-academia-government collaboration and fosters the development of entrepreneurial ventures (more than 205 venture companies have had their start in Tsukuba).

In 2011, the city was designated as one of the seven national “Comprehensive Special Zones for International Competitiveness Development,” strengthening its status as an industrial base and as a platform for science-and-technology based innovation. Leading projects include the establishment of a global nanotechnology research and education complex. Tsukuba Global Innovation Promotion Agency promotes Tsukuba’s International Strategic Zone to transform the city into an international hub of research institutes producing and raising global-scale projects. One of its challenges is to transition from pure or “seed” research to “needs” research that can be commercialized. Tsukuba is also applying for Strategic Global Innovation center status to secure benefits such as tax breaks for small and medium-sized businesses, infrastructure development and training for overseas personnel.

[illegible]

Sources: map and photo from City of Tsukuba website



Stable political structures, strong intellectual property protection and favorable regulatory and tax policies make Singapore an attractive business location.

Global trends

The aftereffects of the recession, coupled with the European sovereign debt crisis, continue to plague business operations in the mature market clusters of North America and Western Europe, including those of life sciences companies of all sizes and maturity levels. Although most life sciences companies continue to enjoy higher profit margins than those of other industry segments, it has become markedly clear that the product development formula of the past no longer applies. As a result, greater emphasis is being placed on the next wave of drugs and treatments – those stemming from biological organisms. Additionally, companies are increasingly diversifying their portfolios to mitigate risk and help fund the lofty costs of innovation, adding generic brands, crop and animal science and even consumer products through mergers and acquisitions.

New product developments have become ever more costly and difficult to achieve. Drug makers are attempting to achieve greater breakthroughs with less funds than in years past. The need to increase a company's likelihood of developing a new treatment continues to steer conversations around location strategy. Although many companies maintain R&D in mature markets rich with people capital and renowned research universities, others are turning to emerging global clusters due to dedicated private and public funding.

Singapore market overview

Overall pharmaceutical sales reached SGD 901.0 million (USD 725.6 million)¹ in 2011 in Singapore according to Business Monitor International. Positive factors such as high income levels (GDP per capita is the highest in Asia), a universal and affordable healthcare system, excellent ratios of doctors and hospital beds per capita are tempered by the limited population size as Singapore is one of the smallest markets in the region.

Despite the modest size of its domestic market, Singapore has the ambition of staying one step ahead of its geographic neighbors and of becoming the "biopolis of Asia." While India and China will flourish due to their immense markets, Singapore's mature business environment and established status as a distribution center make the island country a desirable launching pad into other regional markets. As a result, biomedical sciences (BMS) accounted for 6.0 percent of Singapore's GDP and BMS manufacturing output was more than SGD 23.0 billion (\$18.4 billion)¹ in 2011.

Singapore has a few home-grown companies and has become a top destination for research and clinical research services. Leaders of Asia Pacific research and contract research companies continually identify Singapore as a destination of choice for their regional headquarters. Foreign pharmaceutical companies having R&D bases in Singapore include Abbott Labs, Cell Research Corp, GlaxoSmithKline, Novartis and Takeda.

A large number of multinational pharmaceutical corporations have also established the base of their Asia Pacific manufacturing operations in Singapore. With over 100 biomedical sciences firms, Singapore is home to manufacturing facilities of eight of the top 10 pharmaceutical companies and most of the top medical technology companies. Collectively, they have invested in dozens of commercial-scale manufacturing facilities in Singapore. Illustrating the shift toward the higher end of the value chain, former API or semiconductor facilities have been successfully converted into pharmaceutical facilities.

The segments receiving significant investments include the biologic manufacturing sector, with Baxter, GlaxoSmithKline, Lonza and Roche announcing over SGD 2.5 billion (\$2.0 billion)¹ in capital expenditure to set up their biologic facilities. Neutroceuticals are also present in Singapore, in particular, with the presence of Mead Johnson Nutritionals.

With a disproportionately large volume of pharmaceutical trade flowing in and out of the island (compared with the size of the country), Singapore acts as a trading hub to connect Southeast Asia and the Western world and also a major re-exporter of pharmaceuticals. Retail medicaments and raw materials account for significant proportions of the trade surplus.

¹ Six-month average conversion rate of 1.25 Singapore Dollars (SGD) per U.S. dollar, as of October 2012.

Industry statistics

12.0

Researchers in science, per thousand total employment

Total patent applications, residents only

895

2.3%

Gross expenditure on R&D, as percent of GDP

Location-wise, life sciences activity in Singapore largely occurs in several dedicated parks. The largest research park, Biopolis, is located in one-north, Singapore's ongoing business park under development by JTC Corporation. Also developed by JTC Corporation, the Tuas Biomedical Park (TBP) is a 371-hectare biomedical manufacturing cluster located within the larger Tuas industrial zone in Singapore's western region.

Separately a specialized center, termed MedTech Hub, was launched in April 2012 to cater to medical technology sector. The first project, a multitenanted building called MedTech 1, offers cost savings by providing shared facilities such as sterilization services, specialized warehousing and logistics services to smaller manufacturers, suppliers and service providers in the biomedical science cluster.

Thanks to good connectivity with key Asian markets, secure infrastructure and efficient customs, Singapore presents a strategic home base for companies to tap into the region's fast-growing healthcare markets. Leading Third-Party Logistics (3PLs) providers have set up dedicated life sciences facilities in the city, and Singapore Airport Terminal Services also offers a temperature-controlled Coolport facility. Specialized logistics services parks developed to facilitate pharmaceutical companies' supply chain management and regional clinical trials coordination continue to be in demand.

Industry framework

Intellectual capacity

Over 16,000 individuals are employed in the industry, a highly skilled and reliable workforce that includes more than 6,000 researchers from across the globe. Aware that R&D is dependent on the presence of talent, the Singaporean government has shaped the local education system to develop graduates with skills for work in life sciences, promotes life sciences studies and adapts curricula to fit the industry's needs.

Innovation capital

Two leading research universities are the source for a large share of innovation in Singapore. The National University of Singapore (NUS) has three centers of excellence relevant to the industry: Cancer Science Institute of Singapore, Mechanobiology Institute, Singapore and Singapore Centre on Environmental Life Sciences Engineering. Nanyang Technological University (NTU) offers additional centers, including the Biomedical Engineering Research Centre, the Centre for Biotechnology, the Centre for Chiral and Pharmaceutical Engineering, the Computer-integrated Medical Intervention Laboratory and the Physiological Mechanics Laboratory in addition to several interdisciplinary centers focused on nanotechnology. Both universities have expanded their research and industry-related graduate programs in recent years.

Government support for universities is provided via the National Research Foundation (NRF) and the Education Ministry. Aware that the development of a critical mass of human capital is crucial to the advancement of the domestic research capabilities, the NRF has funded several research centers of excellence, including the first two centers at NUS. More recently, it has developed a new

Campus for Research Excellence and Technological Enterprise (CREATE) that hosts U.S. and European universities eager to establish presence in Asia, with the aim to be a talent magnet and innovation hub. The co-location of public institutions and private research companies in Singapore's largest research park, Biopolis, facilitates innovation support from the government.

Fiscal and political resources

Known for a strong and focused industrial policy, the government is backing the pharmaceutical sector by offering attractive tax incentives, manpower training initiatives and financial backing to the healthcare industry. The incentives and grants offered by the government, in addition to the transparent and open business environment, have played a key role in attracting pharmaceutical giants to set up new R&D bases in Singapore.

The government continues its steadfast investments in growing R&D in Singapore. As part of the Research, Innovation and Enterprise (RIE) 2015 plan, SGD 16.1 billion (\$12.9 billion)¹ has been earmarked, an increase of 20.0 percent over the previous plan and a commitment of 1.0 percent of GDP dedicated to research and innovation. Aiming to increase Singapore's gross expenditure on R&D (GERD) to 3.5 percent of GDP by 2015, the country is expecting a return on investment in terms of economic impact and commercialization of R&D.

The RIE sum allocated to biomedical R&D reaches SGD 3.7 billion (\$3.0 billion)¹ over the next five years. The government has approved the establishment of Sector Specific Accelerators (SSA) to identify, invest and grow start-ups in strategic but nascent sectors, starting with the Biomedical Science Sector. With an initial focus on the Medical Technology (MedTech) subsector, SGD 40.0 million (\$32.0 million)¹ has been set aside to pilot the SSA initiative via the Biomedical Science Accelerator (BSA).

To support the growth of the industry, the government has designated several boards and councils:

- Singapore's Economic Development Board (EDB). Its Biomedical Sciences Group (BMSG) promotes private sector manufacturing and R&D activities while Bio*One Capital functions as the biomedical investment arm of EDB.
- Singapore's Agency for Science, Technology and Research (A*Star). The Biomedical Research Council (BMRC) of A*Star funds and supports public research initiatives.
- Ministry of Health (MOH) – Its National Medical Research Council (NMRC) funds and supports public research initiatives, as well as awards medical research fellowships for the development of medical research manpower.
- Singapore's Biomedical Sciences Industry Partnership Office (BMS IPO).
- Singapore's National Research Foundation (NRF).

Many of the government councils work in close partnership. The BMRC works with the EDB's Biomedical Sciences Group and Bio*One Capital on the Singapore Biomedical Sciences (BMS) initiative. The BMS initiative seeks to develop the biomedical sciences sector into one of the country's economic pillars through a three-phase program running from 2000 through 2015. The

¹ Six-month average conversion rate of 1.25 Singapore Dollars (SGD) per U.S. dollar, as of October 2012.

overall emphasis for BMS Phase 3 (from 2011 to 2015) is the greater amalgamation of activities across the entire BMS community, including public and private sector performers, hospitals and government agencies.

Multiple local and international venture capital (VC) funds are managing billions of dollars worth of funds in Singapore, a substantial amount invested in biomedical industries. Funding programs are available for companies looking to establish manufacturing facilities or R&D centers. Government-affiliated funds such as the Economic Development Board (EDB) are offering investments or channeling money for seed capital, R&D and manpower development. Additionally, foreign direct investments (FDI) into the pharmaceutical industry continue to grow after briefly declining during the global financial crisis.

Outlook

Epicom projects a high, single-digit 2012–2017 CAGR for the Singaporean pharmaceutical market, while the EDB aims to hit a biomedical sciences manufacturing output of SGD 31.3 billion (\$25.0 billion)¹ by 2015, up from SGD 26.3 billion (\$21.0 billion)¹ in 2010. By segment, local industry experts forecast the highly lucrative OTC market to grow by 11.0 percent to 15.0 percent a year, boosted by the country's rising elderly segment, and Epicom expects the biologic sector to grow on the back of massive investment by several large multinational companies setting up biologic facilities.

Singapore is already active among contract research and manufacturing sectors of the industry and hopes to increase penetration into high-tech aspects of research and innovation. The Economic Development Board encourages multinationals coming to Singapore to focus on the higher value-add parts of the business, and prefers to collaborate with the Indonesian and Malaysian government to locate facilities in Batam or Iskandar for manufacturing lower value-add drugs, such as generics. The government is increasing its investment in biomedical sciences research over the period 2011 to 2015.

Strong intellectual property protection laws have already supported growth in the industry. The country is home to several research start-up companies and has attracted investment by large biotech and pharmaceutical firms. Strong infrastructure, strong representation from the industry and government support is expected to help Singapore expand manufacturing and research aspects of the value chain.

¹ Six-month average conversion rate of 1.25 Singapore Dollars (SGD) per U.S. dollar, as of October 2012.

Investment Highlight



Abbott's nutritional powder manufacturing plant in Singapore, source: Abbott Singapore website

Large investments in Singapore

- Completed in April 2008, Abbott's nutritional powder manufacturing plant in Tuas Biomedical Park 2 is the company's first major capital investment in Asia and its largest nutritional investment ever. The SGD 450.0 million (\$360.0 million)¹ fully integrated facility produces powder nutritional products for local consumption and regional exports. Key unit operations include wet processing, evaporation, spray drying, blending and packaging in addition to extensive laboratory facilities and state-of-the-art process control and enterprise planning systems. Abbott operates other facilities in Singapore via Abbott Diabetes Care (design, development and manufacturing of pioneering blood glucose monitoring systems for both home and hospitals), Abbott Diagnostics and Abbott Medical Optics.
- In 2011, Merck announced an investment of SGD 312.5 million (\$250.0 million)¹ over the next 10 years to improve its Tuas manufacturing facilities. With about 1,500 employees in Singapore, Merck will also add capability to its biotech operations to support new product launches and collaborate with local universities to enhance its local workforce's technical expertise. Since it established manufacturing operations in Singapore 1996, Merck's investments in the country have amounted to close to SGD 1.9 billion (\$1.5 billion).¹

Biopolis

Overview

Biopolis is part of a much larger planned development called “one-north,” Singapore’s ongoing business park under development by JTC Corporation. Created to provide space for private companies and public scientific or educational bodies to collaborate in biomedical research, Biopolis is adjacent to the National University of Singapore and the National University Hospital.

Phase I of Biopolis, a 185,800-square-meter, integrated biomedical research complex, was completed in 2003. Out of the seven buildings linked by sky bridges, five are designated for public institution use. Two thousand scientists work there. The 111,500-square-meter space allotted to laboratories includes 35,000 square meters occupied by public research institutes such as the Genome Institute of Singapore, the Bioinformatics Institute and the biomedical research institutes of the Agency for Science Technology and Research (A*Star) that oversees scientific efforts under Singapore’s Ministry of Trade and Industry and hosts scientists of 50 nationalities.

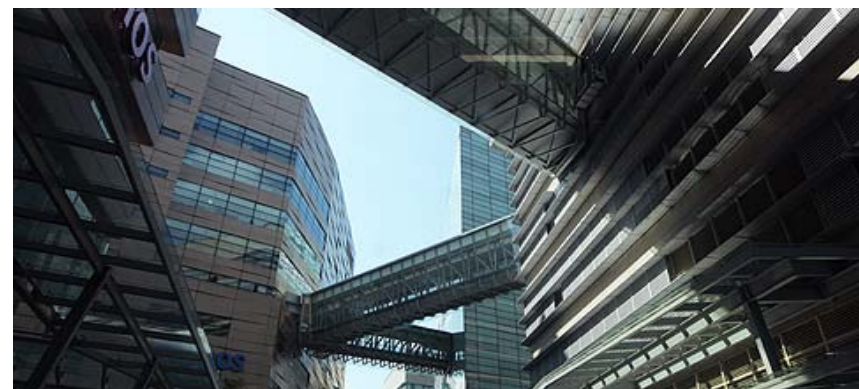
Phase II, completed in 2006, added two buildings totaling about 40,000 square meters. In 2011, Phase III delivered two additional buildings, totaling some 42,000 square meters. Phase IV is entirely taken up by Procter & Gamble for their SGD 250.0 million (\$200.0 million)¹ Innovation Centre, to be completed in 2013. The purpose-built facility will house 400 researchers collaborating with A*STAR on strategic upstream corporate research focusing on new innovations for consumers.

Outlook

Phase V of Biopolis will be completed in 2013 and targets a Green Mark Gold Plus certification. Situated on a land area of 9,621.4 square meters, this phase is meant to improve lab design for clinical trial support and to cater to increased demand for biomedical research, with two towers providing a GFA of just under 47,000 square meters.

JTC Corporation’s ambition is that, when fully developed, the Biopolis will anchor the development of the entire R&D value chain of life sciences in Singapore.

¹ Six-month average conversion rate of 1.25 Singapore Dollars (SGD) per U.S. dollar, as of October 2012.



Source: www.jtc.gov.sg



Biopolis site plan, source: www.jtc.gov.sg

*A key feature of Biopolis’ Phase V biomedical research facility will be 1,000 square meters of new, ready-fitted laboratories called **Shell-plus**. Equipped with mechanical, ventilation and air conditioning system, finished vinyl flooring, basic laboratory furniture and ready-fitted fume hoods, the new laboratories will save biomedical SMEs and start-ups time and resources during their initial set-up phase.*

Tuas Biomedical Park (TBP)

Overview

Tuas Biomedical Park (TBP) is a 360-hectare stretch of ready-prepared and specifically zoned land set aside by the Singaporean government for pharmaceutical and biologics manufacturing, with an investment of SGD 44.0 million (\$35.2 million)¹ and SGD 53.0 million (\$42.4 million)¹ into TBP's two phases. Developed by JTC Corporation, TBP is located within the larger Tuas industrial zone in Singapore's western region. Strategically positioned to provide companies with access to skilled talent, research expertise and air and sea logistics, with the two industrial parks dedicated to manufacturing-related activities for pharmaceuticals, biopharmaceuticals, biologics, vaccine, medical devices and nutrition-related companies.

TBP offers “plug-and-play” opportunities, as well as build-to-suit opportunities for pharmaceutical manufacturers. Most of TBP 1 is occupied or reserved by leading, global biomedical companies such as Pfizer, GlaxoSmithKline, Novartis, Abbott, Roche, Merck Sharp & Dohme, Wyeth Nutritionals, Lonza and Genentech Singapore.

The 20 commercial-scale facilities house process development operations and manufacture active pharmaceutical ingredients (APIs) and novel medicines. Pfizer and MSD GmbH have partnered with Tuas Power to develop state-of-the-art tri-generation facilities. MedTech Hub launched a specialized center in April 2012. Its first multitenanted building, MedTech 1, is under construction and will offer cost savings through shared facilities such as sterilization services, specialized warehousing and logistics services to manufacturers, suppliers and service providers in the biomedical science cluster. Biosensors International, the first firm to set up at the hub, is leasing about 12,000 square meters of space to build a SGD 95.0 million (\$76.0 million)¹ facility.

Outlook

Demand for land at TBP is still active. JTC Corporation achieved a net allocation of prepared industrial land of 1.1 hectare and 18.3 hectare for first half of 2012 and the whole year of 2011, respectively. The nearby port facilities and the planned closer transport links with Malaysia provide seamless access to overseas markets, which value Singapore's products.

¹ Six-month average conversion rate of 1.25 Singapore Dollars (SGD) per U.S. dollar, as of October 2012.



Inside a TBP facility, source: www.jtc.gov.sg



TBP site plan, source: www.jtc.gov.sg

A park catered for high-value biomedical manufacturing, TBP boasts of many firsts in Singapore as firms set up new, large-scale installations there. GSK Biologicals built the first bulk vaccine plant in Asia Pacific in 2009, and Genentech installed the first microbial-based biopharmaceutical manufacturing facility.

Appendix

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