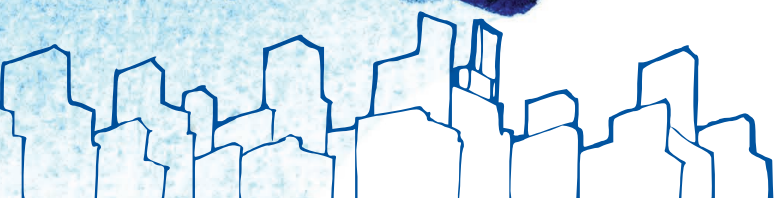
LIFE SCIENCES REAL ESTATE

OPPORTUNITIES AND HOTSPOTS IN INDIA

EXECUTIVE SUMMARY



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Life Sciences Real Estate
– the next big asset class?

India is forecasted to be the fastest growing pharma economy, outgrowing all other major pharma economies, including USA and China.

CPhI's Annual Report - Global Pharma Reputation Ranking, 2018

For a long time, Life Sciences industry in India operated under the banner of manufacturing sector or other industries, having integrated operations, working out of standalone facilities or commercial spaces, etc. During the 1999-2000 period, major milestones were achieved, from formulation of first biotech policy at the State level to conceptualization of India's first organized Life Sciences cluster, resulting in phenomenal growth since then.

Highlight of Life Sciences Industry in India today

Between July to September 2018 alone, the Indian pharma sector had witnessed approx. **39 PE** investment deals worth about **USD 217 Mn**.

Evolving format and structure
of Life Sciences real estate to align better with market dynamics

These changing dynamics will significantly impact preferences of Life Sciences companies for fully developed infrastructure solutions and ready to occupy spaces.

Changing approach to growing seed/ early stage Life Sciences companies

It is estimated that approx. 500 biotech startups were formed in 2017 alone, with approx. 15-20% of these being research start-ups. Funding for such startups was usually a play of debt owners or angel investments. We see a new trend here with large companies and institutions are taking the lead in growing promising ideas to a scalable stage.

Asset light models of operation gaining prominence

Higher cost of R&D, increased regulatory risks as well as shorter product lifecycles are making most companies re-visit their erstwhile approach to owning their own spaces and investing the otherwise blocked capital in mainstream operations.

Value chain integration at a single location/ cluster

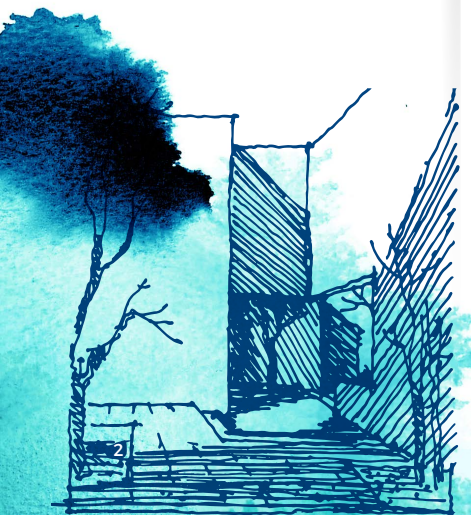
Life Sciences industry has long operated through disparate components — silos that separated R&D, commercial, production, and supply chain, which have a significant bearing on drug approval time and pricing, and seriously hinder financial performance. The global trends reveal that life sciences companies are looking to co-locate their entire value chain operations by shifting to integrated buildings with rationalization of space requirements.

Technology integration & manufacturing efficiencies

With increasing automation and technology integration across the Life Sciences value chain, space requirements for facilities seems to be reducing coupled with specialized infrastructures providing better building efficiencies.

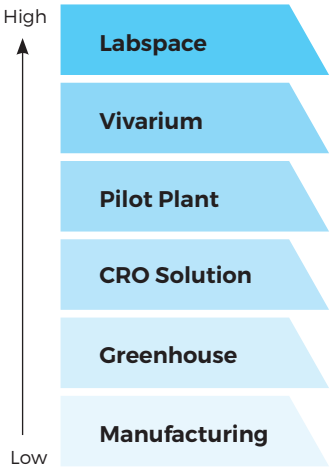
Large format integrated campuses will provide infrastructure solutions

Co-location of value chain processes, increasing preference for asset light model evolving industry trends requiring highly controlled environment, scalability are all highly supportive of creating large format infrastructure with flexible space solutions for Life Sciences companies at all stages.



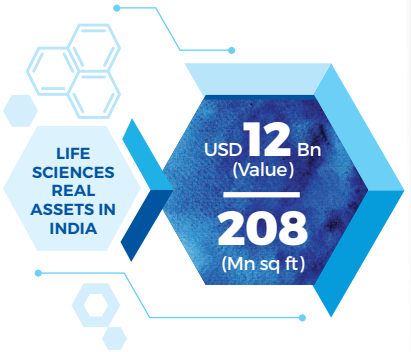
Real Estate Opportunity in Life Sciences

LEASING POTENTIAL BY PRODUCT OFFERING



India is witnessing a breathtaking pace in Life Sciences innovation. **Changing dynamics are creating new models**, the race for talent is quickening and Indian markets are providing more value than ever before. As Life Sciences companies enter a new era of collaborative research and development, resulting in greater demand for flexibility and creative space, **the key is an effective real estate strategy**. This widens the **broad spectrum of opportunities in Life Sciences RE in India, sophisticated by evolving ownership structure, designs and size**. With the increasing trend of **"asset light" model** and demand for integrated Life Sciences buildings, the leasing of spaces is expected to increase. It is noted that lack of organised sophisticated offerings in Life Sciences RE has forced a owned model in the past. However, given the increasing interest from global investors, "Buy and Leaseback" is emerging as a preferred option for Life Sciences companies.

Indian Life Sciences RE is a USD 12 Bn industry with an investment opportunity of over USD 800 Mn, offering an ever expanding market to global investors. Favorable supply/demand dynamics coupled with availability of greenfield and brownfield opportunities hint towards a lucrative market to unlock value by global investors and RE players. The RE providers are expanding their catalogues, offering diverse products to suit the needs of the tenants. The investment by the RE providers can range from USD 35.7 (INR 2,500) per sq ft to USD 142.9 (INR 10,000) per sq ft and offer facilities ranging from bare shell to integrated campus with dedicated plug and play.



	Value	Sq ft
Life Sciences Real Assets in India	**USD 12 Bn**	**208 Mn sq ft**
• Non-Captive (Leased) • Captive (Owned by Life Sciences Players)	USD 2 Bn USD 10 Bn	26 Mn sq ft 182 Mn sq ft
Annual Investment Opportunity – Life Sciences Real Assets	**USD 817 Mn**	**14.3 Mn sq ft**
• Growth Assets • Buy and Leaseback	USD 297 Mn USD 520 Mn	5.2 Mn sq ft 9.1 Mn sq ft
Annual Investment Opportunity – Labspace – Top 15 clusters	**USD 178 Mn**	**3.2 Mn sq ft**
• Growth Assets • Buy and Leaseback	USD 89 Mn USD 89 Mn	1.6 Mn sq ft 1.6 Mn sq ft
Annual Investment Opportunity – Other Life Sciences Real Assets – Top 15 clusters	**USD 435 Mn**	**7.6 Mn sq ft**
• Growth Assets • Buy and Leaseback	USD 134 Mn USD 301 Mn	2.3 Mn sq ft 5.3 Mn sq ft

Opportunity Spectrum for Life Sciences

India has established itself as a preferred destination for global players, driven by double edged benefit of huge domestic demand and global competitiveness that Indian Lifesciences Industry enjoys. The medical technology and biotech sectors expected to grow further, increasing focus on Life Sciences innovation, traditional pharmaceutical companies joined by start-ups and incubator labs are driving new research and development. As such, the demand for collaborative R&D space from existing players is rapidly increasing coupled with increasing willingness from global companies to set footprints. This demand has been witnessed across value chain and products in the Life Sciences Industry.

	SPECULATIVE						BTS
PRODUCTS / SUB-SECTOR	Pilot Plants	Flatted Factories	Labspace	CRO Solutions	Vivarium	Green-house	Clean Manu-facturing
Medical Devices and Injectables		✓	✓				✓
Biologics	✓	✓	✓	✓	✓		✓
Agritech			✓	✓		✓	✓
Traditional Pharma (API)	✓		✓	✓	✓		
Traditional Pharma (Formulation/ OTC)	✓	✓	✓	✓	✓		✓
Vaccines	✓	✓	✓	✓	✓		✓

Speculative: Enhanced warm shell offerings constructed based on standardisation knowledge achieved over years of experience and can be customised for tenant requirements

BTS: Tailor-made development to meet the specifics provided by Tenant

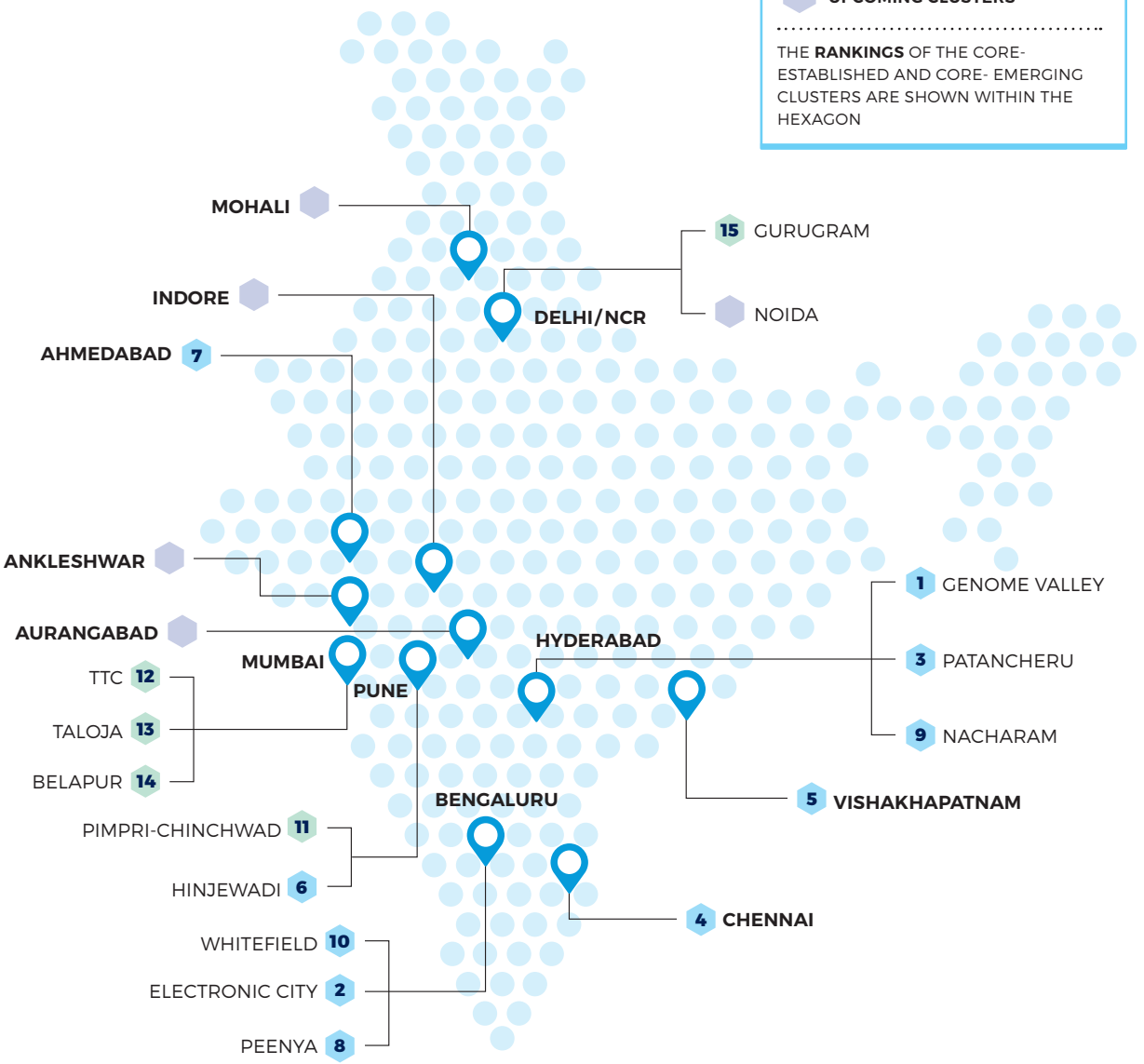
Life Sciences Clusters & Rankings

This report is a maiden attempt at providing a comprehensive view on the concentration of Life Sciences infrastructure in the country, referred to as 'hotspots'.

Legends

- **CORE CLUSTERS : ESTABLISHED**
- **CORE CLUSTERS : EMERGING**
- **UPCOMING CLUSTERS**

THE **RANKINGS** OF THE CORE-ESTABLISHED AND CORE- EMERGING CLUSTERS ARE SHOWN WITHIN THE HEXAGON



The Core Clusters (both Established and Emerging) across India have been ranked, based on the Ranking Methodology shown in the following page.

Ranking of 15 Core Clusters

The comprehensive ranking of the 15 core clusters is presented below. Genome Valley, Hyderabad, Electronic City, Bengaluru and Patancheru, Hyderabad have emerged as the top 3 hotspots for Life Sciences real estate in the country. The existing strong base of Life Sciences industries, institutional ecosystem and on-going support of the local Governments have been the key drivers for these leading clusters.

Rank	Cluster	City / State	Score (out of 100)
1	**Genome Valley**	Hyderabad / Telangana	**84**
2	**Electronic City**	Bengaluru / Karnataka	**67**
3	**Patancheru**	Hyderabad / Telangana	**65**
4	**Taramani**	Chennai / Tamil Nadu	**64**
5	**Parawada**	Visakhapatnam / Andhra Pradesh	**64**
6	**Hinjewadi**	Pune / Maharashtra	**63**
7	**Ahmedabad**	Ahmedabad / Gujarat	**57**
8	**Peenya-Yeshwanthpur**	Bengaluru / Karnataka	**54**
9	**Nacharam**	Hyderabad / Telangana	**50**
10	**Whitefield**	Bengaluru / Karnataka	**46**
11	**Pimpri-Chinchwad**	Pune / Maharashtra	**46**
12	**TTC Cluster**	Navi Mumbai / Maharashtra	**43**
13	**Panvel-Taloja**	Navi Mumbai / Maharashtra	**38**
14	**CBD Belapur**	Navi Mumbai / Maharashtra	**38**
15	**Gurugram**	Gurugram / Haryana	**32**

Ranking Methodology and Framework

1 **INDUSTRY & INFRASTRUCTURE**
Contributes to **45%** of the overall score.

\+

2 **INSTITUTIONAL ECOSYSTEM**
Contributes to **30%** of the overall score.

\+

3 **CLUSTER SUPPORTING FACTORS**
Contributes to **25%** of the overall score.

= **ATTRACTIVENESS OF LIFE SCIENCES CLUSTER**

Cluster Performance on Key Parameters

Cluster dynamics, inherent strengths and areas for betterment in each of the Life Sciences clusters across the country are observed to be highly diverse and varied both in their quality and scale. While the overall ranking captures their comprehensive positions, the following is a snapshot of cluster performance on some of the key parameters.

Top 3 Clusters
Industry Concentration

Rank	Cluster/ City	Score
1	Electronic City, Bengaluru	100
2	Genome Valley, Hyderabad	95
3	Ahmedabad, Gujarat	85

Top 3 Clusters
Life Sciences Parks in India

Rank	Park/ Cluster/ City	Score
1	Genome Valley, Hyderabad	90
2	Ramky Pharma City, Parawada, Visakhapatnam	75
3	International Biotech Park, Hinjewadi, Pune	70

Top 3 Clusters
Life Sciences Incubators in India

Rank	Cluster/ City	Score
1	Genome Valley, Hyderabad	90
2	Taramani, Chennai	80
3	Electronic City, Bengaluru	70

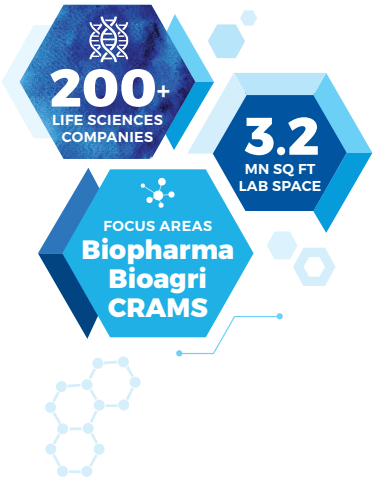
Top 3 States
Government Proactiveness

Rank	State	Score
1	Telangana/ Andhra Pradesh	100
2	Gujarat	85
3	Karnataka/ Maharashtra	65

Top 3 Cities
Life Sciences Education

Rank	Cluster/ City	Score
1	Bengaluru	95
2	Chennai	85
3	Pune	80

Core Clusters – Established



Genome Valley
HYDERABAD

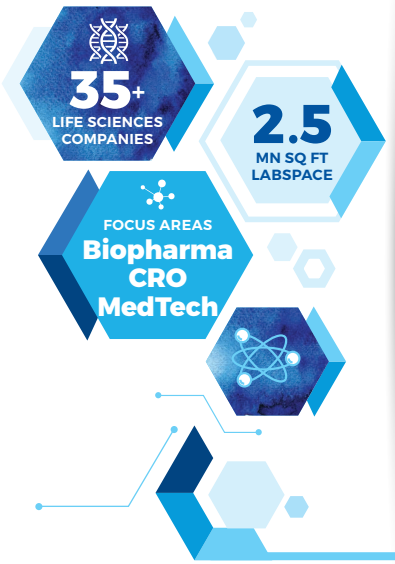
RANK 1

SCORE 84/100

Genome Valley is one of the earliest, largest and most vibrant R&D cluster in the country focusing on pre-clinical research, drug discovery contract manufacturing, vaccines clinical research, pharma/ biotech and agri-research. More than 200 Life Science companies have facilities in this cluster across 3 major focus areas – Biopharma, CRO, Agri, Chemicals & MedTech.

Key players:

NOVARTIS | Lonza | FERRING PHARMACEUTICALS | DUPONT



Electronic City – Bommasandra – Jigani
BENGALURU

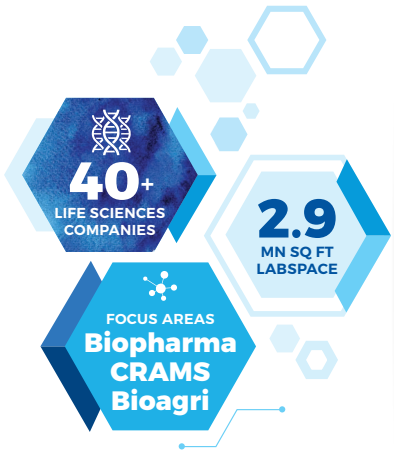
RANK 2

SCORE 67/100

The Electronic City – Bommasandra – Jigani cluster has a thriving Life Sciences ecosystem. It is home to R&D facilities of world's leading Life Sciences companies as well as best-in-class educational and incubation centres, namely the Bangalore Bio-innovation Centre (BBC) and Institute of Bioinformatics & Applied Biotechnology (IBAB).

Key players:

Biocon | Syngene (A Biocon company) | Mylan | 3M Science. Applied to Life.™

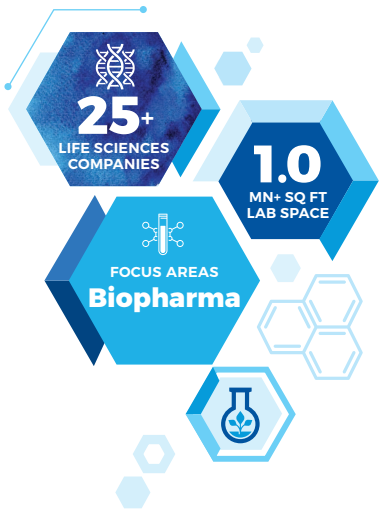


Patancheru
HYDERABAD

The Patancheru-Jeedimetla-Balanagar cluster is a well-established industrial region with presence of specialized infrastructure, strong institutional support and an existing network of industries. More than 40 Life Sciences companies have facilities in this cluster across 3 major focus areas – Biopharma, CRAMS & Bio Agri.

Key players:

AUROBINDO | Dr.Reddy's | Biocon



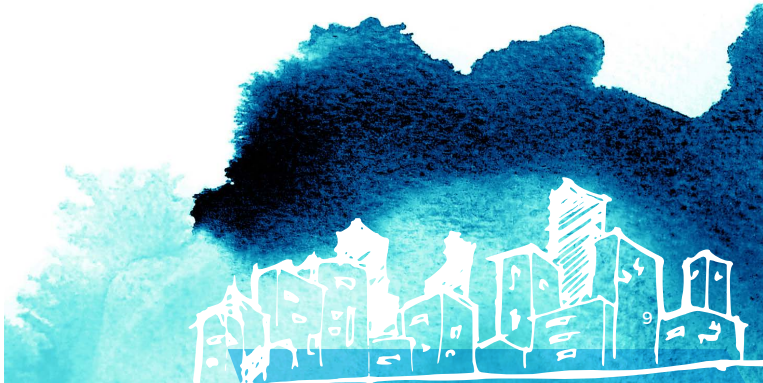
Taramani
CHENNAI

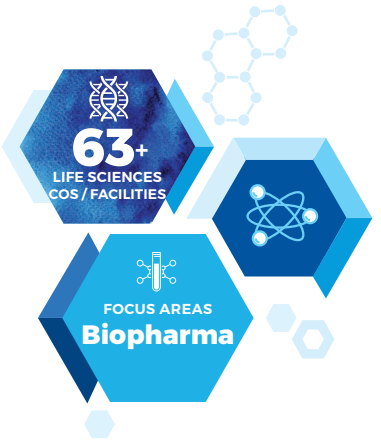
Taramani, located in the south-central part of Chennai is a prime commercial and industrial cluster in the city. Taramani has 25+ Life Sciences companies with representation from Biopharma, CRO, Medicinal Biotechnology, Nutraceuticals, etc along with an operational Biotech Park -TICEL Bio Park.

It has a diverse range of companies from MNCs (such as AstraZeneca, J&J, SGS, Perkin Elmer) to Indian corporates (Swiss Garnier, Saksin Life Sciences, Hospira Healthcare, AtheneseDx) to state-owned companies (HLL Biotech) and pure research centers (Baba Clinical and Genomic Research Centre, IITM Research Park).

Key players:

SGS | AstraZeneca | PerkinElmer | AtheneseDx





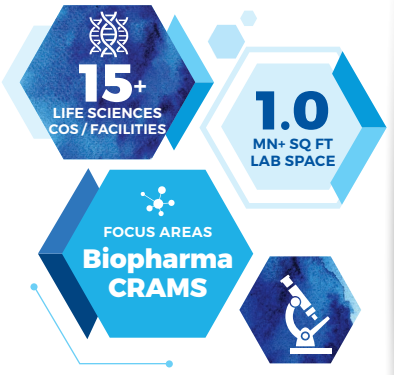
Parwada
VISAKHAPATNAM

Located south of Visakhapatnam, Parawada is a key industrial area in Andhra Pradesh. More than 63 Life Sciences companies have facilities in this cluster mainly focusing on BioPharma. Major players such as PharmaZell, Eisai, Hospira (Pfizer), Suven, Laurus Labs etc. occupy lab space here.

Parwada is also home to the Jawaharlal Nehru Pharma City (JNPC), a pharma SEZ set up under Public Private Participation (PPP) and consists of more than 63 tenants in the Life Sciences sector.

Key players:

PharmaZell | LAURUS Labs | SUVEN Life Sciences | Eisai

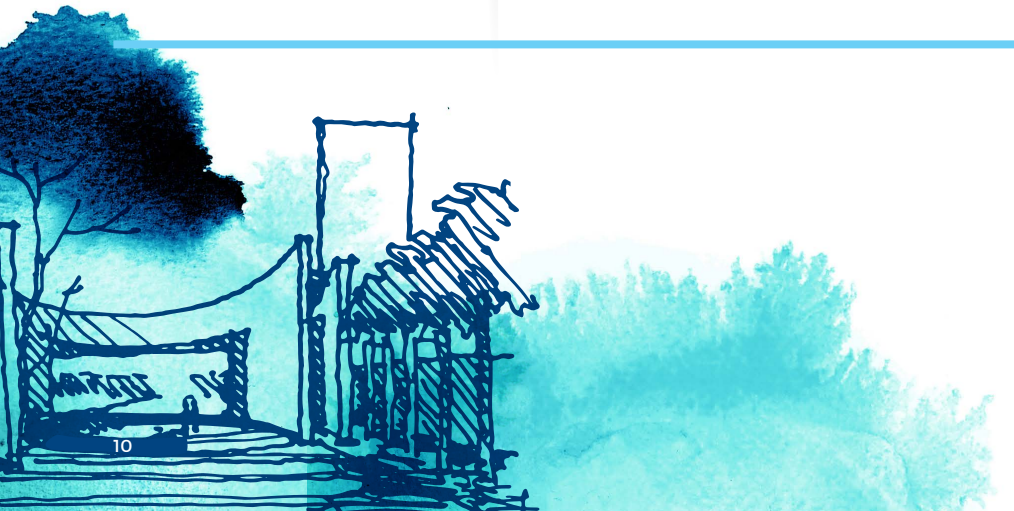


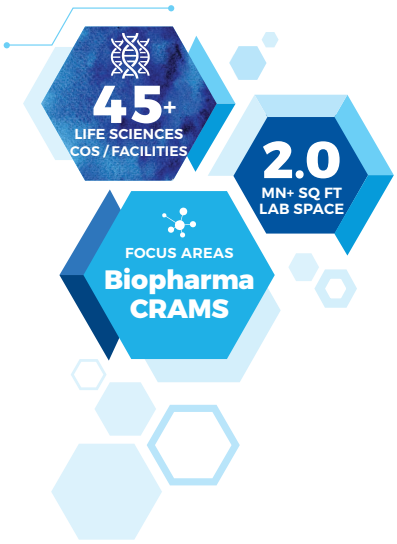
Hinjewadi
PUNE

Hinjewadi is a prominent industrial cluster in 'Smart City' - Pune. Over the recent years, it has emerged as a holistic cluster for industrial, commercial and residential needs. While the cluster has been predominantly known for its IT industry, the concentration of Life Sciences companies has greatly increased with the establishment of International Biotech Park (IBP). About 15 Life Sciences companies have facilities in this cluster mainly focusing on Biopharma & CRAMS.

Key players:

HIKAL | Centaur | Emcure SUCCESS THROUGH INNOVATION | SciGen | LUPIN



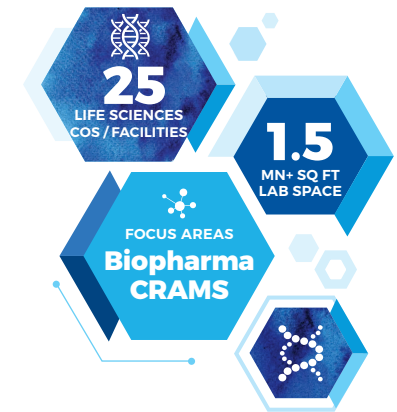


Ahmedabad
GUJARAT

Ahmedabad is one of the biggest clusters in Gujarat for Life Sciences operations. The Ahmedabad - Gandhinagar corridor has emerged as an innovation, technology & R&D hub. The primary focus of Pharma/ Biotech research in Ahmedabad is towards Formulations, APIs, Biologicals and Contract Manufacturing. Ahmedabad has 45+ Life Sciences companies with a focus on R&D, Manufacturing, Export and CRAMs. Zydus, Cadila, Torrent, Intas and Dishman together account for more than 50% of the Life Sciences space in the city.

Key players:

Zydus dedicated to life | torrent PHARMA | INTAS | dishman

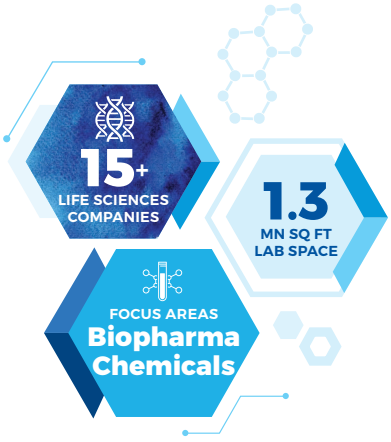


Peenya – Yeshwantpur
BENGALURU

Peenya Industrial area was established in 1970 and is one of the earliest pharma and research integrated hubs in Bangalore. In Life Sciences, the cluster is well known for R&D, drug, manufacturing and pre-clinical services. Global players such as ITC, Jubilant, Merck, Eurofins, Astra Zeneca, etc. occupy lab space in the cluster.

Key players:

ITC Enduring Value | JUBILANT BIOSYS | MERCK | eurofins

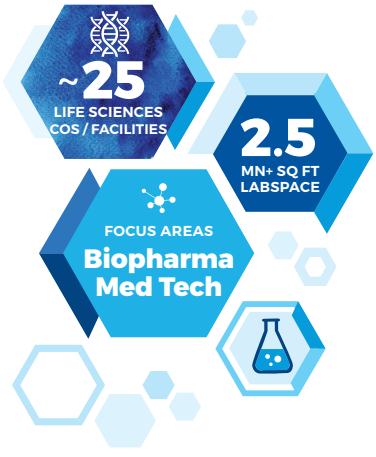


Nacharam – Mallapur – Uppal
HYDERABAD

The Nacharam–Mallapur–Uppal cluster is an established industrial cluster in the eastern part of Hyderabad. The cluster houses 15+ Life Sciences companies including GVK Biosciences. The cluster has the potential for incubating new ventures given the supporting ecosystem.

Key players:

GVK BIO Accelerating R&D | Sapala | Avra | Vivimed

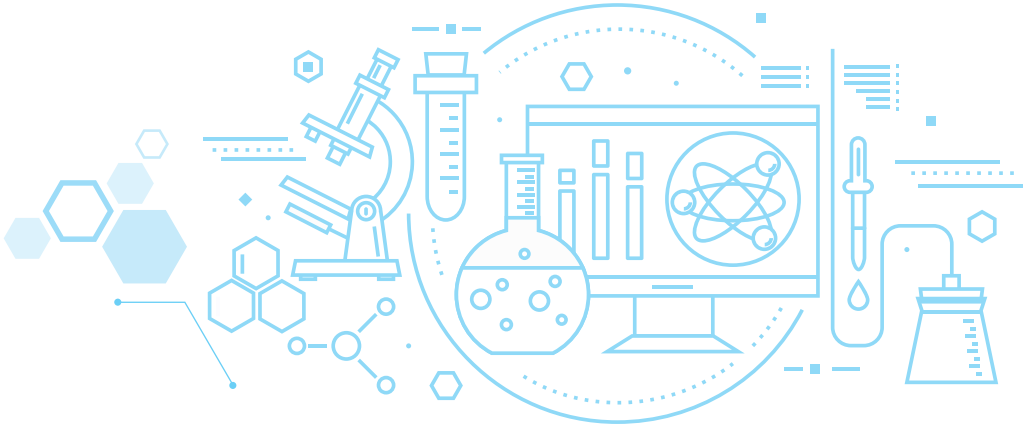


Whitefield
BENGALURU

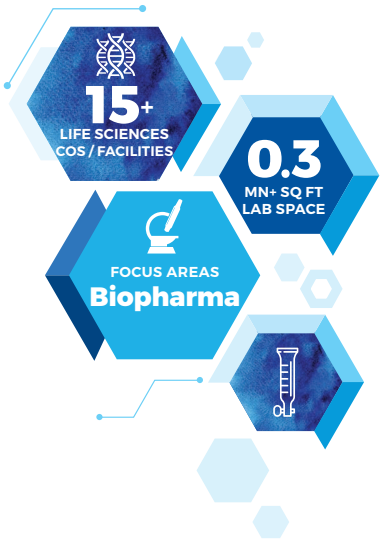
Predominantly an IT cluster, White field has seen burgeoning number of life sciences startups in the recent past. In the Life Sciences space, Whitefield has emerged as MedTech and Medical Devices hub housing major equipment players such as GE and Thermo Fischer India (Invitrogen), HUL, Novo Nordisk, etc.

Key players:

GE | Hindustan Unilever Limited | invitrogen part of life technologies | novo nordisk



Core Clusters - Emerging



Pimpri- Chinchwad
PUNE

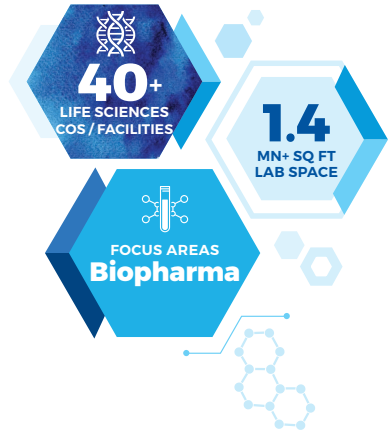
RANK 11

SCORE 46/100

Pimpri-Chinchwad region is a major industrial cluster, comprising of four major micro-markets – Bhosri, Pimpri, Chinchwad and Talwade and is also popularly known as "Industrial Township". Better known for its auto and ancillary industries, the cluster has a sizeable number of Life Sciences companies with around 15+ companies with a focus on Biopharma. Bilcare, HAL, Haffkine, etc. are the largest companies in this cluster which is otherwise populated by small and medium sized Life Sciences companies.

Key players:

Hindustan Antibiotics Limited | More Than 100 Years of Haffkine Service to Mankind | Emcure | GENPHARMA INTERNATIONAL PVT. LTD.



Trans Thane Creek (TTC)
MUMBAI

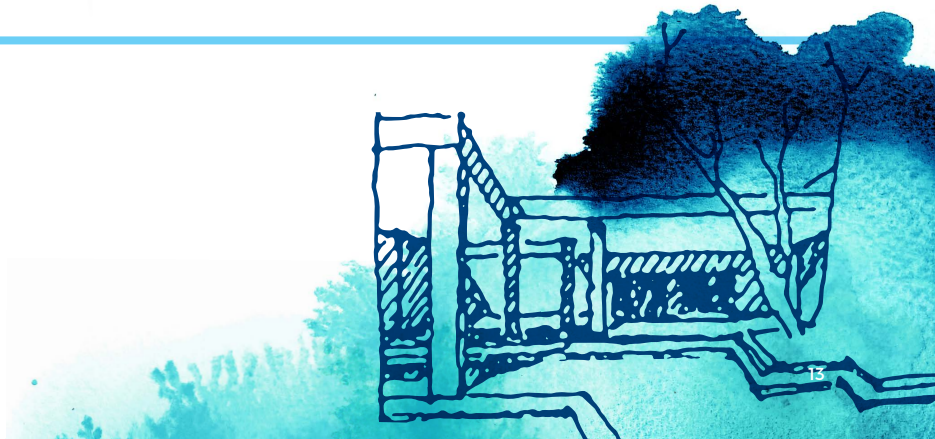
RANK 12

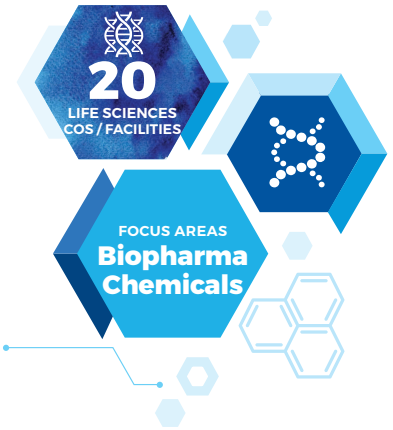
SCORE 43/100

Trans Thane Creek, popularly known as TTC, is a fairly large industrial area, operated under different zones, each with a specific focus industry – Airoli, Rabale, Ghansoli, Mahape, Koper Khairne, Pawane, Turbhe, Digha and Nerul. The cluster has 40+ Life Sciences companies with a major focus on BioPharma. One of TTC's largest anchor tenants is Reliance Life Sciences. In addition, this to, Zydus Takeda Center, USV, Inventia, etc. have significant presence.

Key players:

Reliance Life Sciences | Zydus | Takeda | USV | inventia





Panvel Taloja

MUMBAI

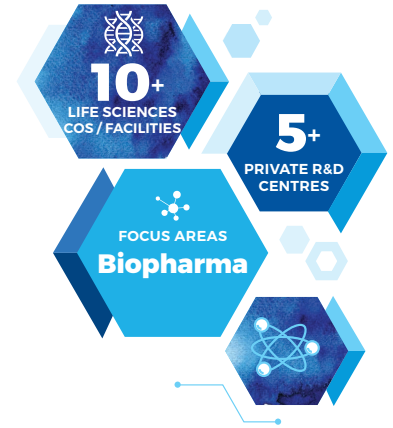
RANK 13

SCORE 38/100

Taloja Industrial Area (TIA) is situated adjacent to Navi-Mumbai and Panvel and is spread across approx. 2,157 acres.
TIA comprises of companies in Life Sciences industries such as chemicals, bulk drugs and pharmaceuticals, petrochemicals, etc. It houses more than 20 Life Sciences companies specialising in biopharma and chemicals.

Key players:

Glenmark | Dow | ALKEM



CBD Belapur

MUMBAI

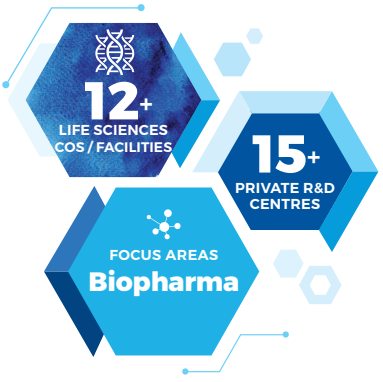
RANK 14

SCORE 38/100

The C.B.D. Belapur (Central Business District of Belapur) is one of the fastest developing regions in Navi Mumbai in terms of new commercial and residential growth. Although Life Sciences activity is a relatively smaller cluster in terms of industry critical mass but offers opportunity for growth. Around 10+ Life Sciences companies operate in this cluster with a focus on Biopharma.

Key players:

HIKAL | HEMMO PHARMACEUTICALS PVT. LTD. WE UNDERSTAND PEPTIDES | Milagro Clinical Research



Gurugram

DELHI NCR

RANK 15

SCORE 32/100

Gurugram (previously called Gurgaon) has emerged as a leading financial, and industrial hub with the third-highest per capita income in India. Gurugram cluster has a strong presence of MedTech, Healthcare and Pharma manufacturing companies. About 12 Life Sciences companies have facilities in this cluster mainly focusing on BioPharma.

Key players:

gsk | Mankind | SUN PHARMA | Boston Scientific

Upcoming Clusters

The ongoing Life Sciences industrial activities and Government focus on promoting the Life Sciences sectors have led to the identification of the following as Upcoming Clusters.

Growth Drivers	
Industry Critical Mass	Medium
Government Proactiveness	High
Workforce Avaliability	High

Mohali SAS Nagar
PUNJAB

SAS Nagar, Mohali is a fast-developing industrial area, with strong focus on Biotechnology, among other Electronics and Engineering industries. Mohali cluster houses about 25 Life Sciences companies, namely Sun Pharma, Panacea Biotec, Ltd, Parkins Pharma, etc. and several good quality research institutions.

Key players:

SUN PHARMA | Panacea Biotec *Innovation in support of life* | Parkinson *For Serene Life*

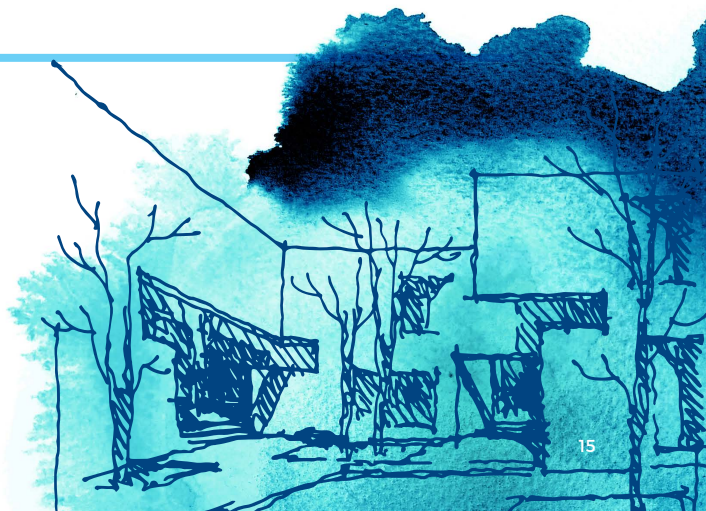
Growth Drivers	
Industry Critical Mass	Medium
Government Proactiveness	Medium
Workforce Avaliability	Medium

Noida
DELHI NCR

Noida is a large planned satellite city under the management of the New Okhla Industrial Development Authority (or NOIDA). In the Life Sciences space, Noida is home to a total of more than 13 Life Sciences companies. Some of these notable establishments include Jubilant Chemsys, BAFCO and Revita Life Sciences.

Key players:

JUBILANT CHEMSYS | BACFO *Rejuvenating Life. Naturally* | REVITA LIFE Sciences *Stem Cell Research & Therapies*



Growth Drivers	
Industry Critical Mass	High
Government Proactiveness	High
Workforce Avaliability	Low

Ankleshwar
GUJARAT

The AIA (Ankleshwar Industrial Area) is spread over approx. 1600 hectares, with over 1200 registered businesses and is becoming an ideal location for a wide range of industries, Life Sciences being an important part. The Area houses more than 20 Life Sciences companies, mainly focusing on biopharma and chemicals. Majority of companies located here are Indian pharma players such as RPG, Intas and chemical manufactures such as ZCL, Bakul Pharma etc.

Key players:

RPG LIFE SCIENCES LIMITED | INTAS | ZCL CHEMICALS LTD. | BAKUL building Solutions LLP

Growth Drivers	
Industry Critical Mass	High
Government Proactiveness	High
Workforce Avaliability	Medium

Indore
MADHYA PRADESH

Indore is one of the largest producers of pharmaceutical formulations (tablets, capsules etc.) in India. The cluster houses India's biggest pharmaceutical trade house, "Dawa Bazar", that hosts large number of wholesale & retail outlets of manufacturers. More than 20 Life Sciences companies have facilities in this cluster mainly focusing on Biopharma and chemicals.

Key players:

Cipla | Mylan | LUPIN | ZODIAC®

Growth Drivers	
Industry Critical Mass	High
Government Proactiveness	High
Workforce Avaliability	Medium

Aurangabad
MAHARASTRA

Aurangabad is a traditional manufacturing hub with established companies in pharma, auto & components, food, plastics among others. In the Life Sciences space, Aurangabad is home to around 18 Life Sciences companies and around 6 notable education institutes.

Key players:

WOCKHARDT | Mylan | Indoco INDOCO REMEDIES LIMITED

Credits

This report is made possible by **JB Cerestra Investment Management LLP, a joint venture between Jacob Ballas and Cerestra Advisors**.

JACOB BALLAS

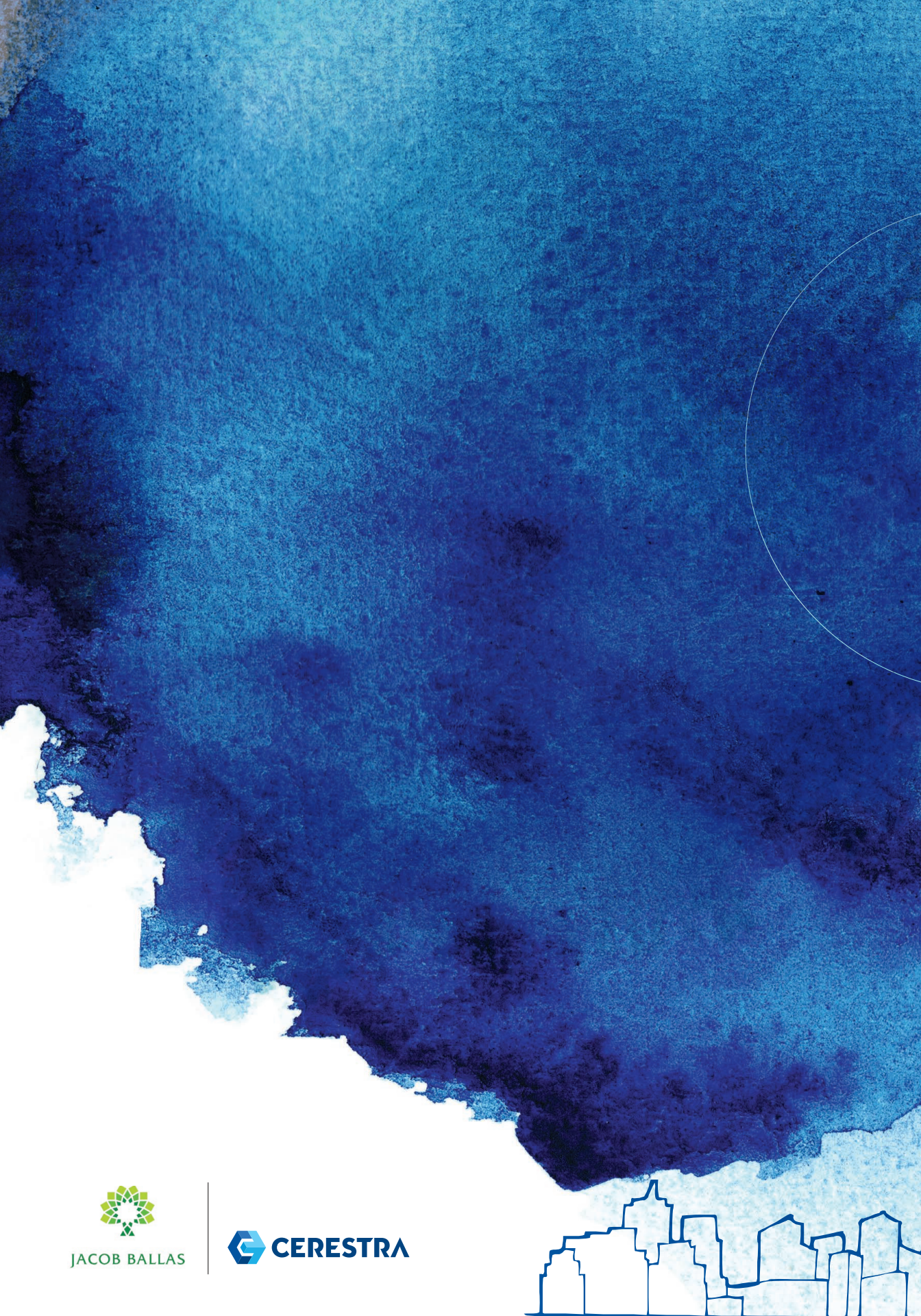
Jacob Ballas Capital (India) Pvt Ltd (JBC), a New Delhi based leading private equity advisory firm has over USD 640 Mn in assets under advice. It has 2 decades of multi-sector investment experience in India. It is anchored by JBC shareholders including New York Life Insurance Company and ExcelFin.

CERESTRA

Cerestra Advisors Pvt Ltd is a real estate focused advisory firm with established track-record of value creation. It is led by a team with over 4 decades of real estate investment experience. Cerestra is sponsored by The Capital Partnership, a UK based multi-strategy investment firm with USD 7 Bn in AUM.

INDIA INDUSTRIAL PORTFOLIO

JB Cerestra Industrial Strategy proposes investment in core / core+ industrial assets, "Business Critical" to the tenant, in pre-identified clusters across select industrial segments. The target assets could be stable ready-assets, built to suit assets, pre-leased assets, partially leased assets and brownfield assets in India advantage sectors including Life Sciences, Apparel, and other specializations.


JACOB BALLAS
CERESTRA