

BIOTECHNOLOGY



JANUARY 2016

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BIOTECHNOLOGY



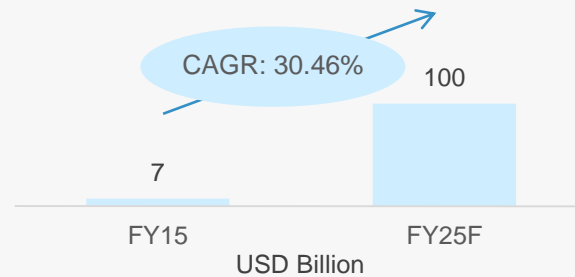
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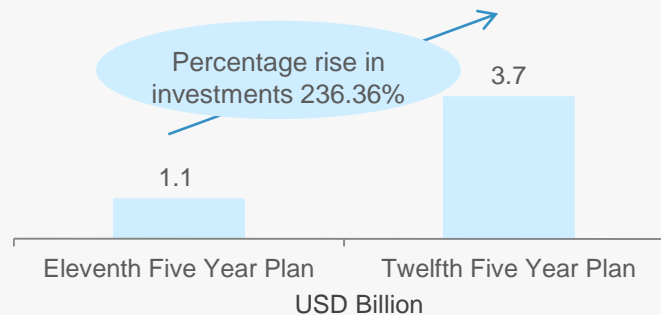
EXECUTIVE SUMMARY

The biotech industry is expected to experience significant growth amid favourable business conditions



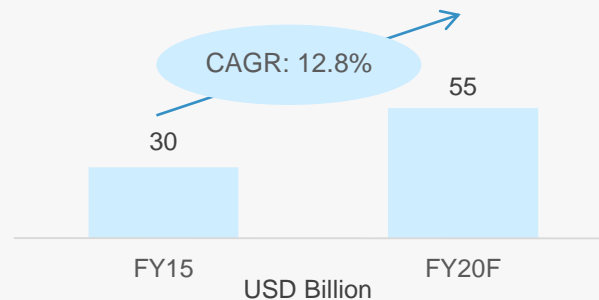
By FY25, India's biotech industry is estimated to increase to USD100 billion from USD7 billion in FY15

Increasing government expenditure is likely to augment growth



In 12th Five-Year Plan, the government aims to spend USD3.7 billion on biotechnology compared to USD1.1 billion in the 11th Five-Year Plan

Growing pharmaceuticals market is estimated to aid growth of the biotech industry



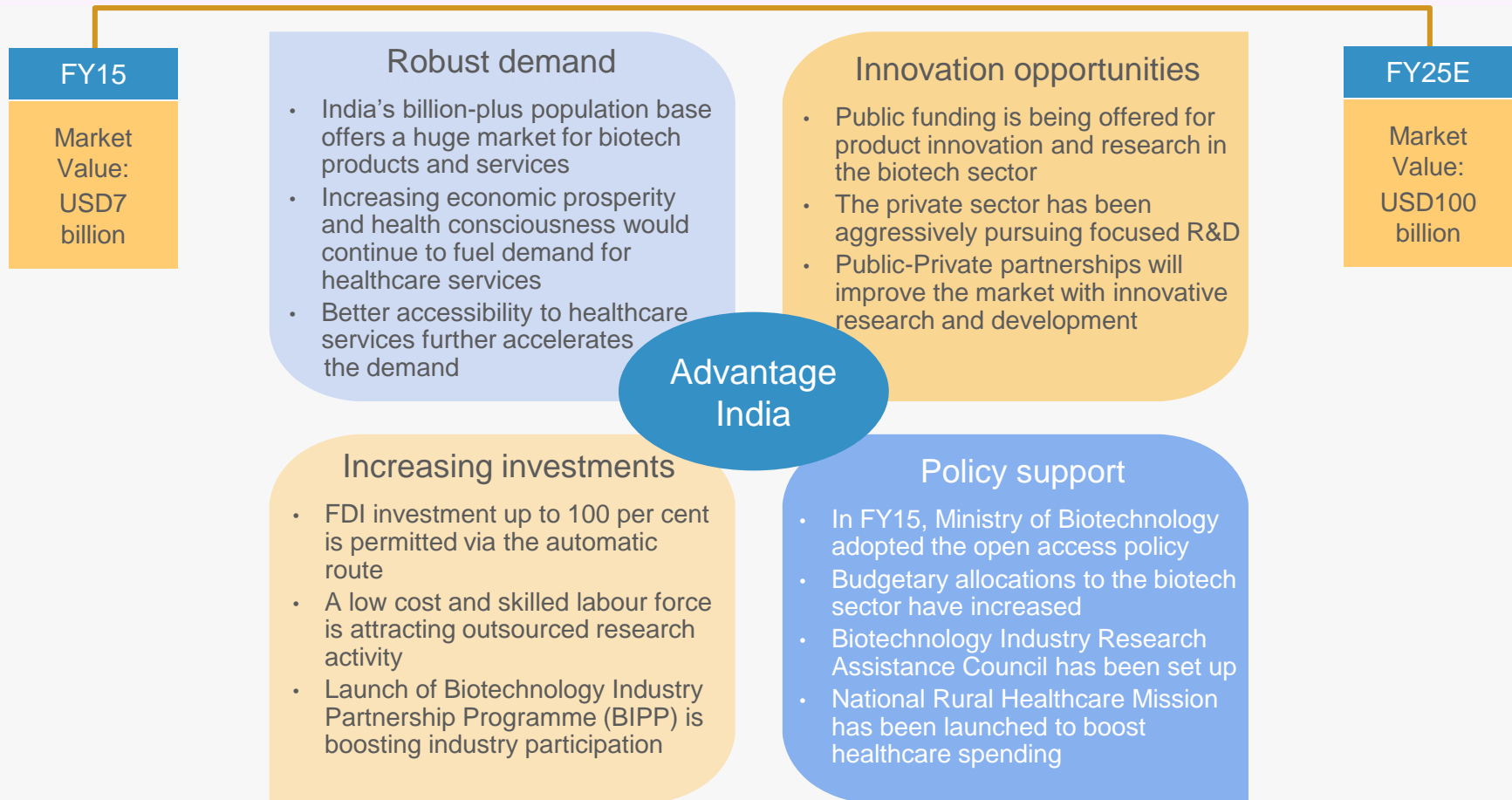
India's pharmaceuticals market size is USD30 billion in 2015 and estimated to reach at USD55 billion in 2020F

Source: Department of Biotechnology, Ministry of Science & Technology, Ministry of External Affairs, Government of India, Make In India, TechSci Research

Note: F - Forecast



ADVANTAGE INDIA

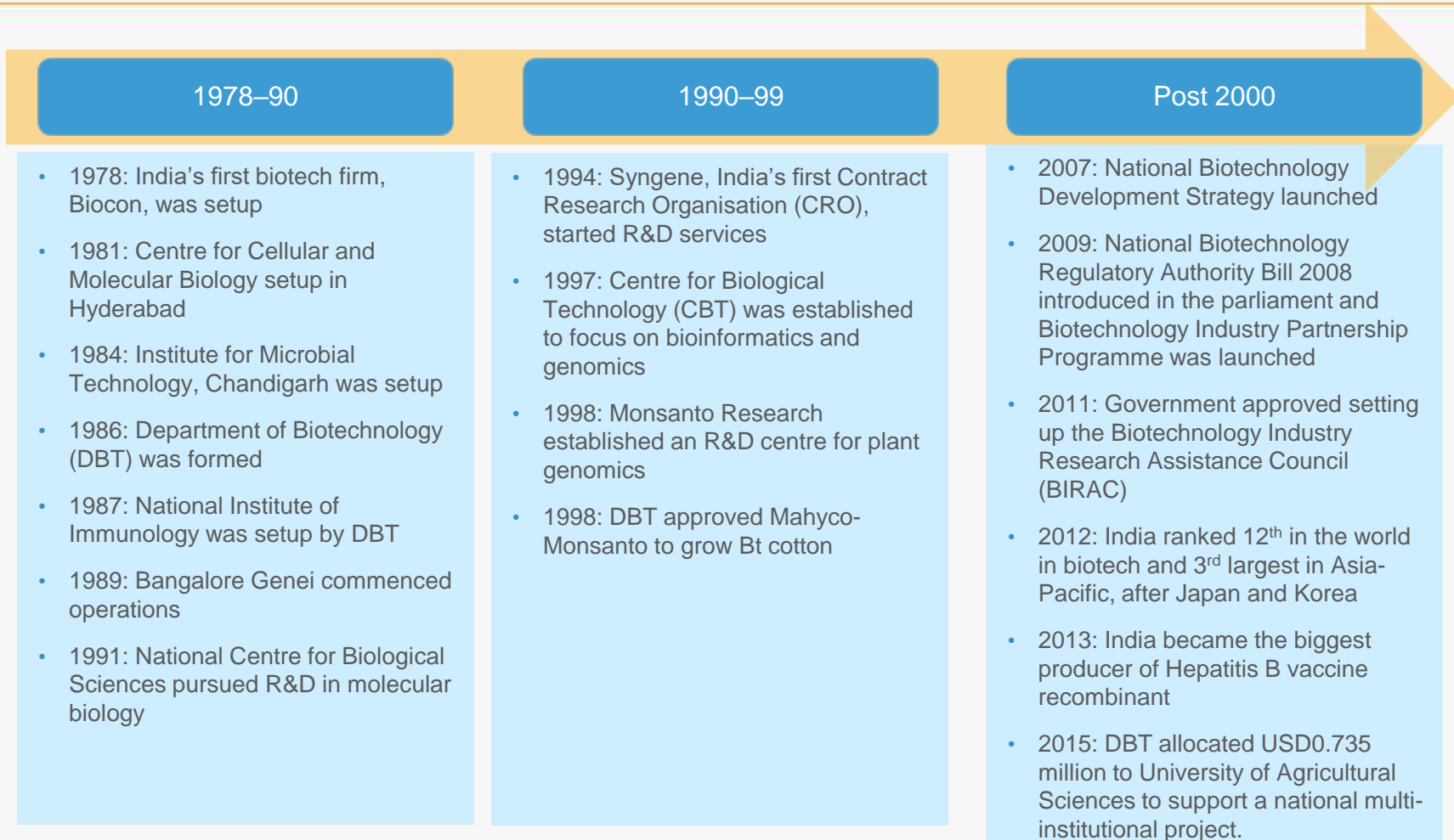


Source: CIS India, Ministry OF External Affairs, Government of India, Ministry of Health,, ABLE, TechSci Research
Note: E - Estimate



MARKET OVERVIEW & TRENDS

MAJOR MILESTONES IN INDIAN BIOTECHNOLOGY INDUSTRY

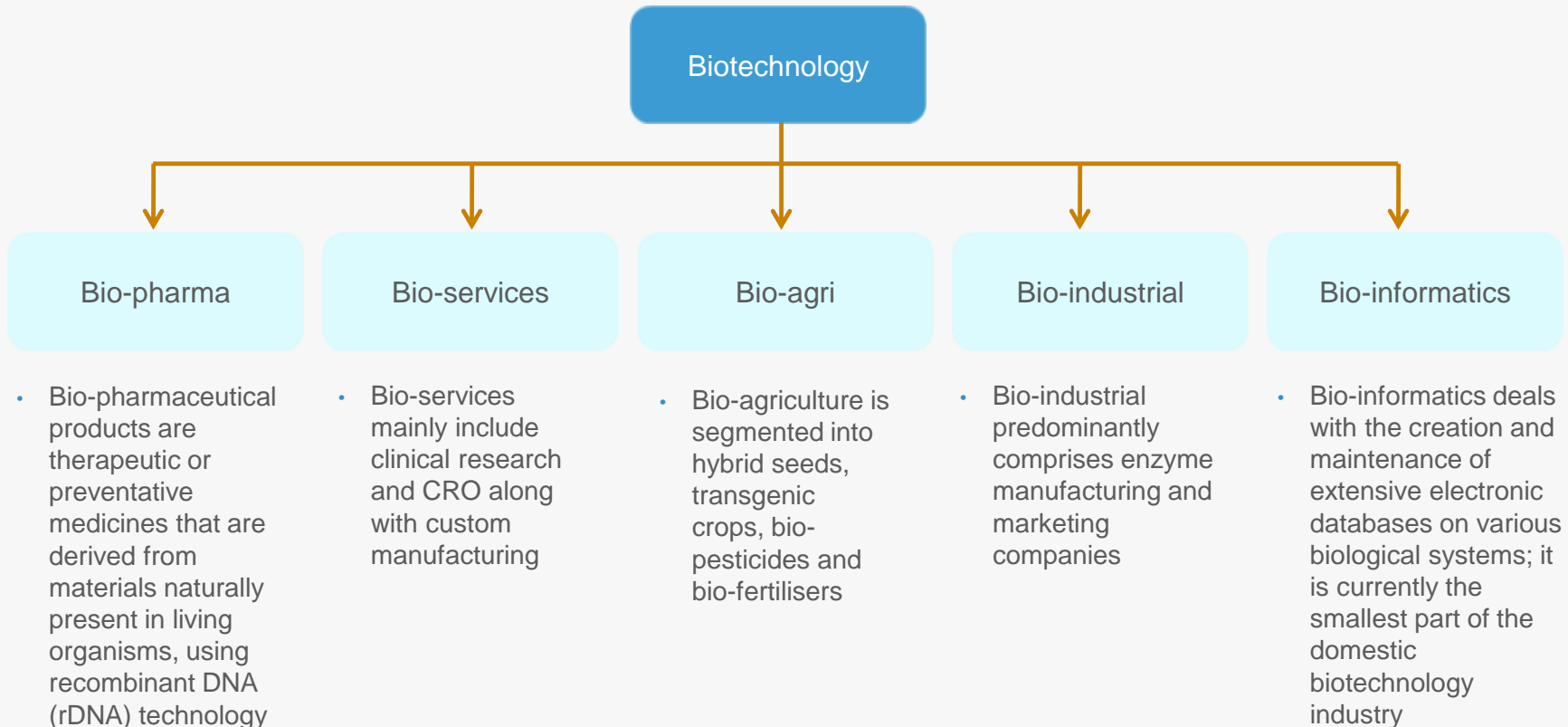


Source: EXIM bank of India research, MakeinIndia, Ministry of External Affairs, CII, TechSci Research

Note: R&D - Research and Development

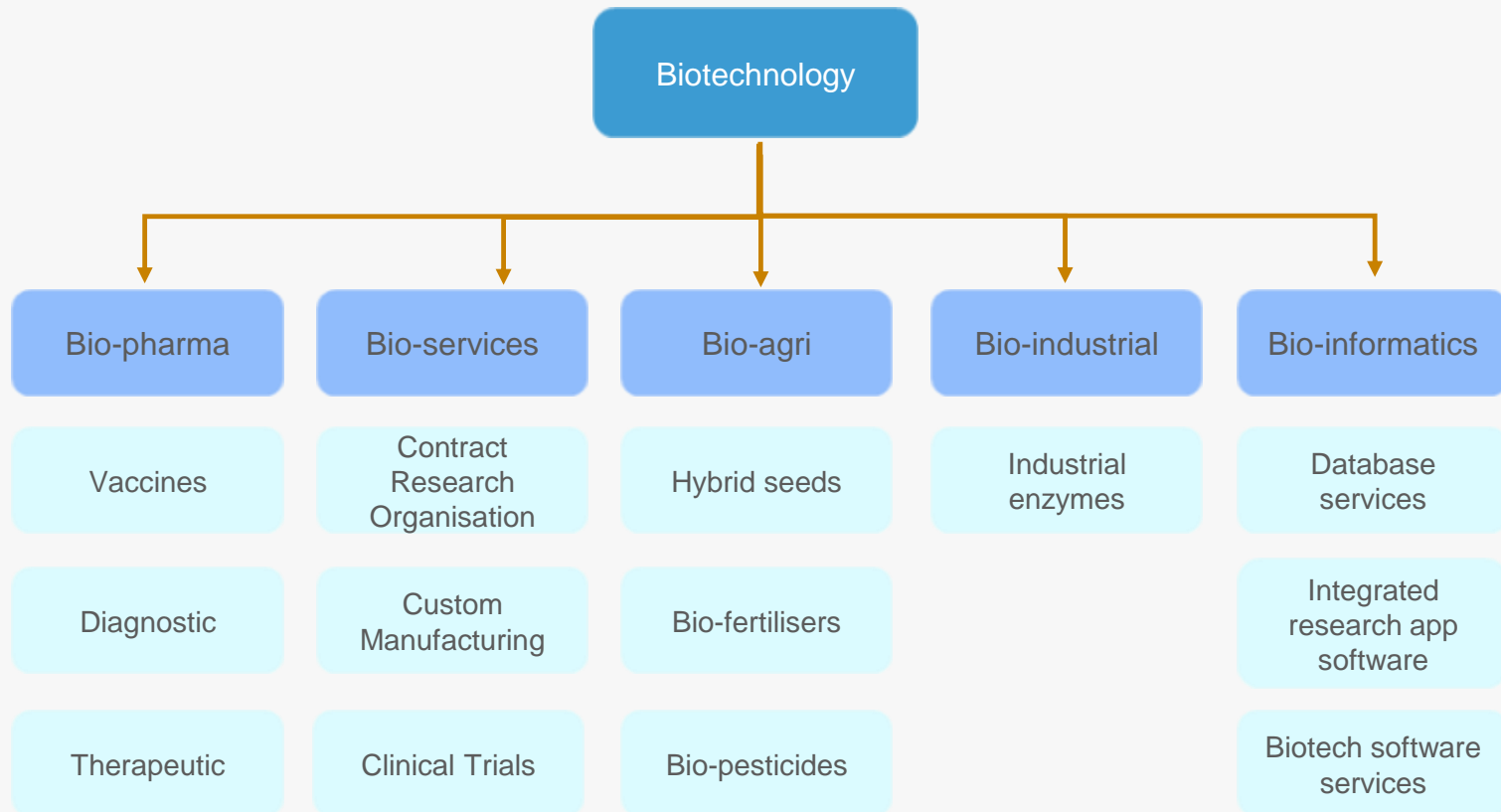
DBT – Department of Biotechnology

KEY SEGMENTS IN THE INDIAN BIOTECHNOLOGY INDUSTRY



Source: ABLE - Biospectrum Industry Survey, June 2013; TechSci Research

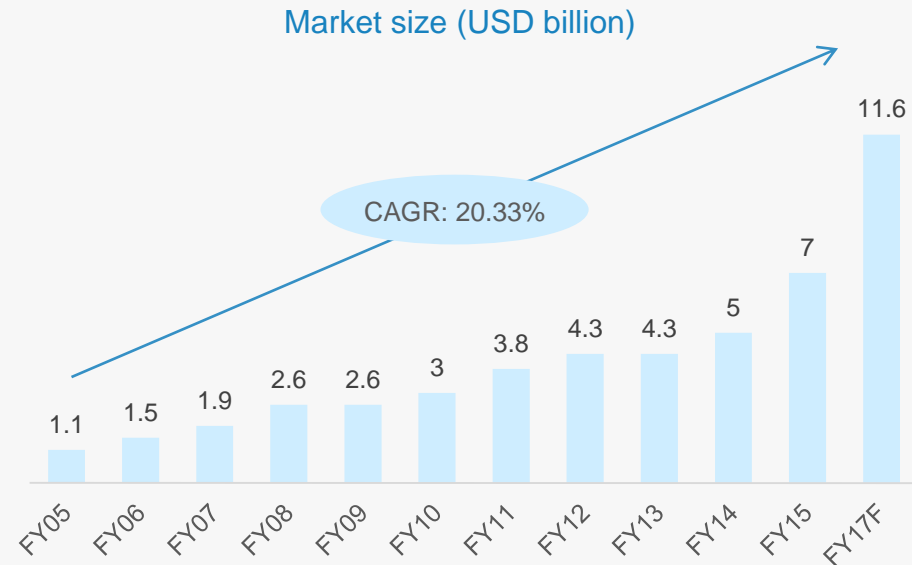
MAJOR PRODUCTS/SERVICES OF THE INDIAN BIOTECHNOLOGY INDUSTRY



Source: ABLE - Biospectrum Industry Survey, Ministry of External Affairs, TechSci Research

ROBUST GROWTH IN BIOTECH INDUSTRY

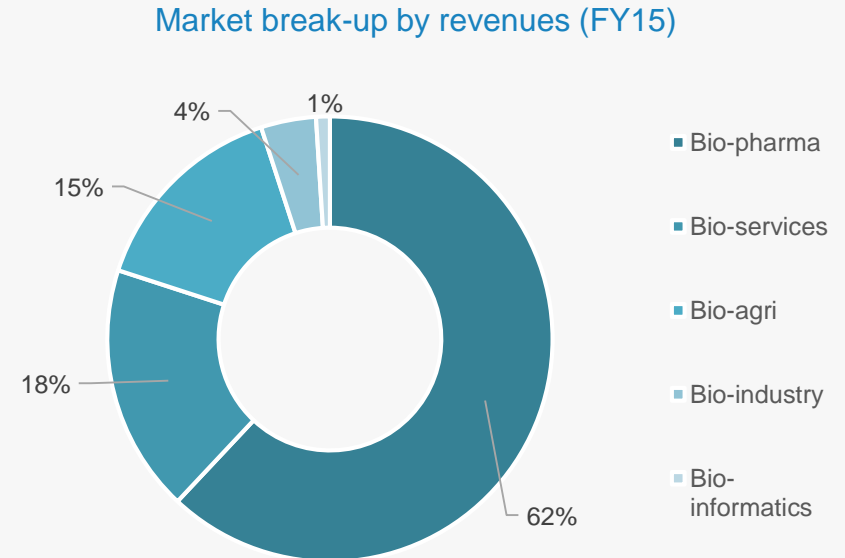
- * Maintaining the momentum of the previous years, the Indian biotech industry grew 16.28 per cent in FY14; the total industry size was USD5 billion at the end of the financial year and it reached USD7 billion in FY15
- * Fast-paced growth is likely to continue; the industry is expected to increase in size to USD11.6 billion by 2017, driven by a range of factors such as growing demand, intensive R&D activities and strong government initiatives
- * Fast-developing clinical capabilities with the country becoming a popular destination for clinical trials, contract research and manufacturing activities



Source: ABLE - Biospectrum Industry Survey, Makeinindia, Ministry of External Affairs, TechSci Research Global Industry Analysts Report (GIA)
Notes: CAGR - Compound Annual Growth Rate
Note: F-Forecast

BIO-PHARMA ACCOUNTS FOR MAJORITY MARKET SHARE AND WITNESSES FASTEST GROWTH IN FY15

- * The bio-pharmaceutical segment accounted for the largest share of the biotech industry, with 62.0 per cent of total revenues in FY15. Revenue from bio-pharma exports reached USD2.2 billion in 2013, accounting for 51 per cent of total revenues of the biotech industry
- * Serum Institute of India is the largest BioPharma company in the country and accounts for approximately 22% of BioPharma market in FY15
- * India is becoming a leading destination for clinical trials, contract research and manufacturing activities which is leading to the growth of bio services sector
- * In FY15, the bio-services and bio-agri segments accounted for 18.0 per cent and 15.0 per cent of the biotech industry, respectively
- * The bio-services segment recorded the highest growth 11.78% in FY14, followed by bio-informatics (7.9 per cent) and biopharma (6.23%)

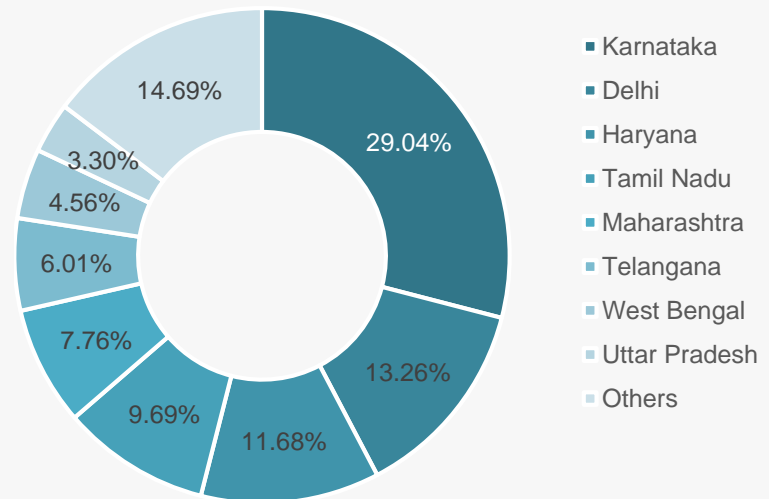


Source: ASSOCHAM, Makeinindia, TechSci Research

STATE WISE SHARE FOR APPROVED BIOTECH PROJECT COST FY15

- * In FY15, provision of USD89.47 million has been made by Department of Biotechnology for the approved biotechnology projects in India.
- * Karnataka is the hub for biotechnology sector. Investments of USD25.95 million was allocated towards biotechnology projects in Karnataka. Delhi has the second largest share with 13.26 per cent.
- * In FY15, total project cost approved to Delhi is USD11.87 million

State wise share for Approved Biotech Project Cost FY15



Source: Department of Biotechnology, TechSci Research

NOTABLE TRENDS IN THE INDIAN BIOTECH SECTOR

Remarkable global positioning

- India is among the top 12 biotech destinations in the world
- India ranks second in Asia, after China
- India is the world's largest producer of recombinant Hepatitis B vaccine

Pharma companies focusing on biotech

- Ranbaxy, Cadila Healthcare, Lupin, Wockhardt and Dr Reddy's are among the major Indian pharmaceutical companies operating in the bio-pharma segment

Global companies setting up base

- US based DiabetOmics Inc, medical diagnostic company has raised USD4 million from Ventureast and USD1 million from KI Varaprasad Reddy for driving manufacturing and commercialisation activities in India.

Biosimilars and molecular diagnostic remain strongholds

- Growth in the sector is anticipated to come from the country's strong position in biosimilars and molecular diagnostics as well as personalised medicine (where export and domestic trends look promising)

Growth in Genetically Modified crops

- According to International Service for the Acquisition of Agri-Biotech Applications, India has the fourth largest area covered under genetically modified crops
- In India, 11.57 million hectares of area is covered under genetically modified crops which is majorly dominated by Bt cotton.

Source: Ministry of External Affairs, TechSci Research, Indian Law Offices

Bt:



STRATEGIES ADOPTED

STRATEGIES ADOPTED

Strategic collaborations with niche players

- Indian biotech firms are partnering with niche players to broaden their product portfolio and strengthen global reach
- Strand Life Sciences recently collaborated with US-based El Camino Hospital to establish a genomics and pharmacogenomics centre in San Francisco, while Hyderabad-based GVK Biosciences entered into an agreement with the US FDA for drug repositioning

Mergers & Acquisitions

- Companies in the industry are exploring new avenues in life sciences to strengthen and upgrade the products and services portfolio through strategic mergers and acquisitions. In June 2015, Dr. Reddy's Laboratories acquired UCB (India) for USD131.02 million. The acquisition has been done for established brands of UCB in India, Nepal, Sri Lanka and Maldives

Stepped up investment in personalised medicine

- Pharma companies, including Avesthagen, TCG Life Sciences, Advinus Therapeutics and Jubilant Biosys have stepped up investments in personalised medicine. The idea is to eliminate the unpredictable nature of drug development through personalised medicine. For instance, Xcode Life Sciences uses InDNA technology to provide personalised solutions for lifestyle-related diseases, such as coronary, diabetes and obesity, using saliva samples. Action Biotech provides genetic tests to predict response from chemotherapy drugs. Geneombio Technologies offer gene-based prediction to assess genetic susceptibility towards major lifestyle diseases

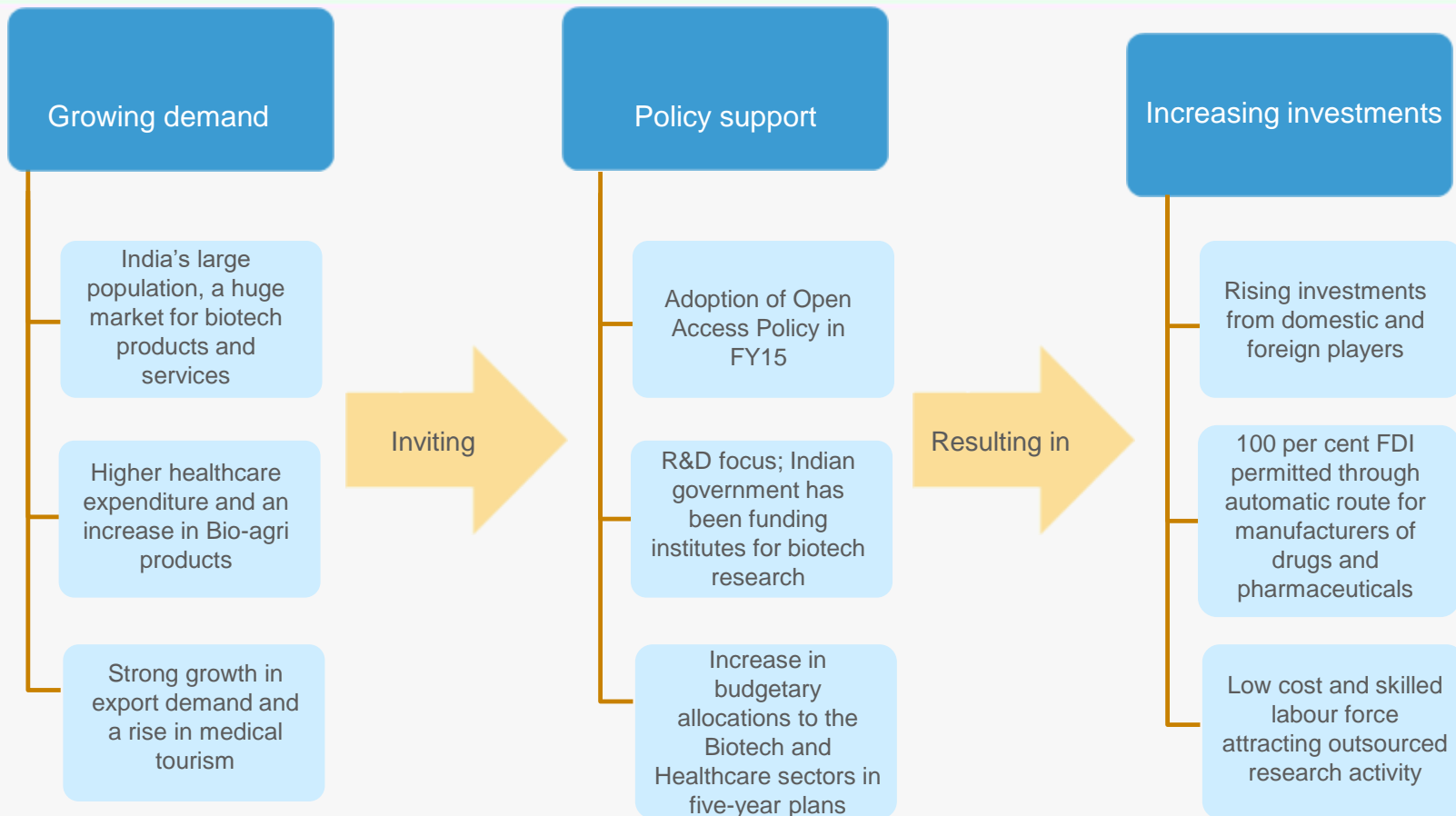
Ramping up service offerings

- Companies are evolving their product mix to reflect growing repertoire in Biologics, Branded Formulations and Research Services
- In FY15, Biocon launched Bionesp, antibody for managing anaemia in its early-stage.



GROWTH DRIVERS

SECTOR BENEFITS FROM RISING INCOME AND POPULATION



Source: Makeinindia, TechSci Research

HIGHER HEALTHCARE EXPENDITURE DRIVING DOMESTIC DEMAND

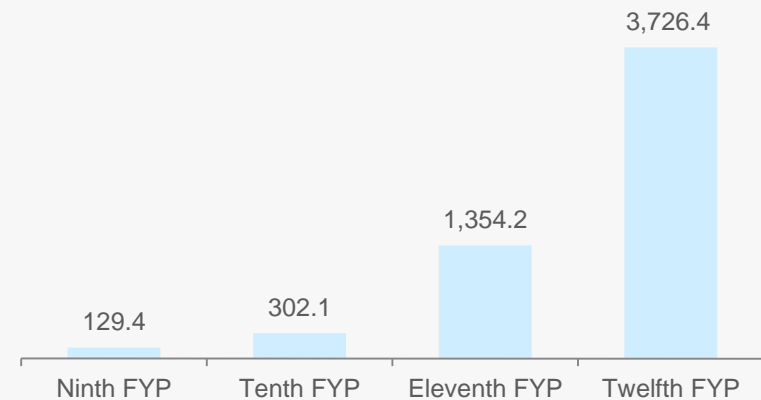
Exponential growth in government funding

- Government spending on healthcare, as a percentage of GDP, for the 12th Five-Year Plan is around 2.5 per cent, and to at least 3 per cent of GDP by 2022.
- Government has announced to allocate USD5.43 billion to its healthcare department. Medical tourism in India has reached to USD3.6 billion in FY2015
- During the 11th Five-Year Plan, the Department of Biotechnology utilised 94.49 per cent of the allocated resources

Specialised treatment

- The disease profile that inflicts the Indian population has experienced a gradual shift. The number of lifestyle-related diseases being reported is rising; this has led to demand for various kinds of specialised treatments
- Ailments such as cancer and diabetes have led to a higher demand for biological products

Funds availability (USD million)



Preventive healthcare

- Around 1.2 billion ailments are reported annually, and this number is expected to rise at a CAGR of 30 per cent to 15 billion cases by 2015. Better access to healthcare facilities and rising lifestyle diseases are driving this trend
- Population growth has elevated the vaccine demand for the geriatric and paediatric population

Source: WHO Statistics 2012
Note: FYP – Five Year Plan

Source: MHRD,
National Biotechnology Development Strategy, DBT, TechSci Research

RISING INCOME AND INCIDENCE OF CHRONIC LIFESTYLE DISEASES

Rising income; growing middle class

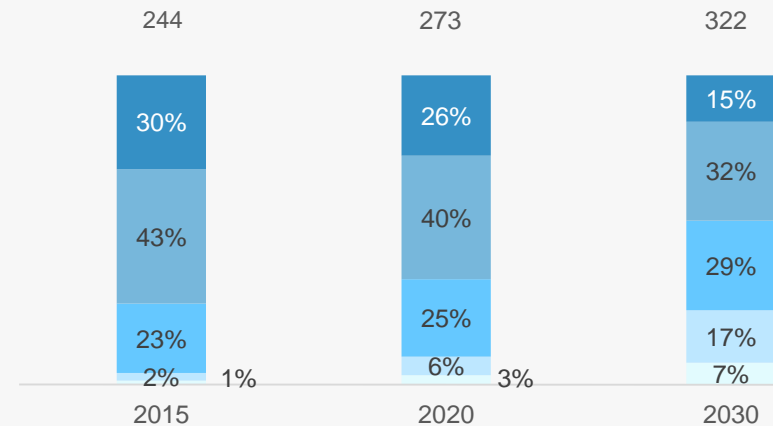
- Per capita income and rural income are increasing
- The number of middle class households (earning between USD4,413.1 and USD22,065.3 per annum) is estimated to increase more than fourfold to 148 million by 2030 from 32 million in 2010
- Rising per capita income leads to increased spending on medical and healthcare services

Higher incidence of chronic lifestyle diseases

- Lifestyle diseases are set to account for a greater part of the healthcare market
- Lifestyle diseases such as cardiac diseases, cancer and diabetes are treated with the help of biotechnology products, thereby boosting revenues of biotech companies

Notes: Greater distributional efficiencies and increasing demand (especially from rural areas) due to rising disposable incomes have created new markets for products within the country, F - Forecast

Million household, 100%



Income segment

- Globals(>22065.3)
- Strivers(11032.7-22065.3)
- Seekers(4413.1-11032.7)
- Aspirers(1985.9-4413.1)
- Deprived(<1985.9)

Source: Fortis Healthcare Limited 2008–09, McKinsey Quarterly, NCAER, TechSci Research

STRONG POLICY SUPPORT CRUCIAL TO THE SECTOR'S DEVELOPMENT

Programme for SC/ST and Rural Population

- Training and demonstration programme in various biotechnology based activities were undertaken to empower the population resulting in socioeconomic upliftment

Biotechnology Based Programme for Women

- Programme on application of biotechnology for women was done to provide employment, skill development, awareness generation, health improvement, and socio-economic upliftment of the women population

National Biotechnology Development Strategy

- DBT designed the National Biotechnology Development Strategy (NBDS) to strengthen the industry's human resources and infrastructure while promoting growth and trade
- As part of the NBDS, government decided to spend 30 per cent of DBT's Budget in public private partnerships to promote R&D at various stages

Single-window clearance

- As per NBDS, a proposal has been made to set up the National Biotechnology Regulatory Authority (NBRA) to provide a single-window clearance mechanism for all bio-safety products to create efficiencies and streamline the drug approval process

Biotechnology Industry Research Assistance Council

- BIRAC has been established to promote research and innovation capabilities in India's biotech industry
- Under BIRAC, the government will provide funding to biotech companies for technology and product development

Tamil Nadu Bio technology Policy 2014

- The Policy aims to encourage new companies to operate in Tamil Nadu, thereby increasing the Research & Development and manufacturing activities in the sector

"Biotechnology Policy 2015-2020" (Andhra Pradesh)

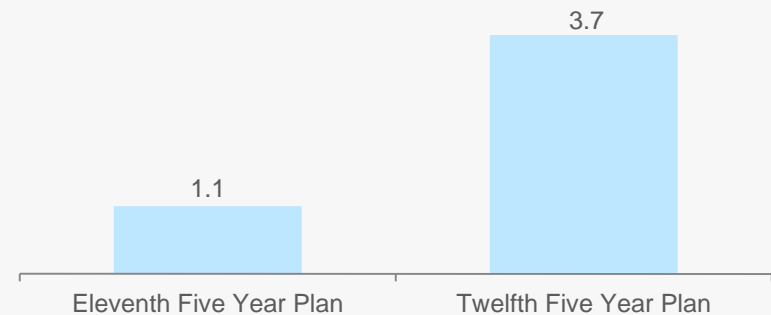
- The Policy has been formulated to promote biotechnology sector in Andhra Pradesh. The new policy covers the benefits for the following categories: Incubation Centres, Biotech manufacturing industries, Life Science Park, Life Science Knowledge Centre, Research & Development Centres.

Source: "Biotechnology facilities," Department of Biotechnology, TechSci Research
Note: BIRAC - Biotechnology Industry Research Assistance Council

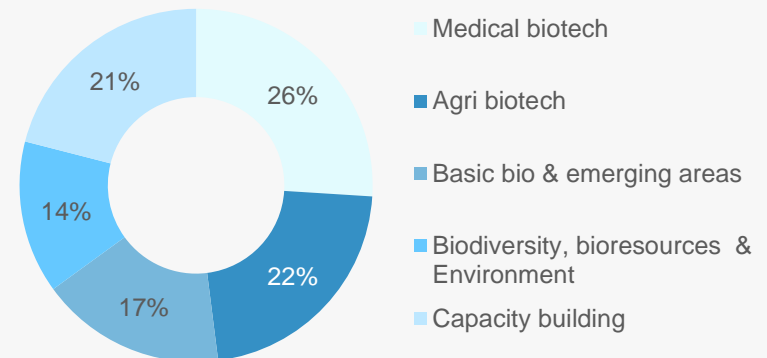
BIOTECH IN FOCUS IN 12TH FIVE-YEAR PLAN

- * The overall strategy of 12th Five-Year Plan is to accelerate the pace of research, innovation and development. The main objective is to advance biotechnology as strategic area by taking India's strengths in foundational sciences to globally competitive levels. In addition, emphasis is on expanding the application of biotechnologies for overall growth of bio- economy within the framework of inclusive development
- * The 12th Five-Year Plan aims to accelerate the pace of research, innovation and development to improve biotechnology in India
- * The government plans to strengthen regulatory science and infrastructure, which involves setting up the Biotechnology Regulatory Authority of India (BRAI) and a central agency for regulatory testing and certification of laboratories
- * The plan also entails expanding and commissioning new bioclusters at Faridabad, Mohali Kalyani and Hyderabad
- * It aims to encourage and increase the pool of research scholars and scientists by three-fivefold in biological and interdisciplinary space across levels (PhD, PDFs, young faculty)

12th Five-Year Plan expenditure (USD billion)



12th Five-Year Plan fund allocation (USD billion)



Source: Deptt. of Science and Technology, TechSci Research

GOVERNMENT FUNDING CRUCIAL FOR THE BIOTECH INDUSTRY

Research Funding Agency

- The DST has consistently enabled transformational changes through appropriate responses and non-participative roles. DST accordingly played the role of an extra mural research funding agency wherein competitive grants for research was provided to investigators based on technical merit. In 2015, DBT and Tekes (Finland) joined to form an alliance to fund international standard joint projects to address Indian and global needs

Venture fund

- The government announced a plan to set up a USD2.2 billion venture fund to support drug discovery and research infrastructure development projects
- Government funding is crucial for the biotech industry due to limited access to other sources of funding

Infrastructure development

- India's central government and state governments, in collaboration with private players, continue to develop new infrastructure facilities, especially at biotechnology parks
- The government is developing three major biotech clusters at Mohali in Punjab, Faridabad in Haryana, and Bengaluru in Karnataka. It plans to set up an agri-biotech cluster in Pune (Maharashtra) and Kolkata (West Bengal)

International collaborations

- India has partnered with countries such as the UK, Russia, Italy, the US and France to enable knowledge transition.
- In 2015, the UK Medical Research Council (MRC) and the Government of India Department for Biotechnology (DBT) formed an alliance to fund three major global research centers

Clinical Establishments Bill

- In a move to standardise procedures, the Indian Parliament passed the Clinical Establishments Bill 2010, which would make registration of clinical trials as well as clinical research organisations mandatory in the country
- The Bill also includes standard operating procedures for various trial related tasks

Source: Ernst & Young, Times of India, TechSci Research; Note: DST-Department of science and Technology, DBT-Department of Biotechnology

CENTRE AND STATE GOVERNMENT INITIATIVES PROVIDE BIG BOOST TO BIOTECH INDUSTRY

Increasing government support

International collaboration of Department of Biotechnology with other countries

100 per cent foreign equity investment is possible in manufacturing of all drugs except recombinant DNA products and cell targeted therapies

Single window processing mechanism for all biotech projects involving FDI

Depreciation allowance on plant and machinery raised to 40 per cent from 25 per cent

Customs duty exemption on goods imported in certain cases for R&D

Customs & excise duty exemption to recognised Scientific & Industrial Research Organisations (SIRO)

150 per cent weighted tax deduction on R&D expenditure

Three years excise duty waiver on patented products

100 per cent rebate on own R&D expenditure

125 per cent rebate if research is contracted in public funded R&D institutions

Joint R&D projects provided special fiscal benefits

Set up a venture capital fund to support small and medium enterprises

Promote innovations through BIPP, SBIRI, BIRAC and Biotech parks

Adoption of new Open Access Policy in FY15

Favourable IP climate

Indian Copyright Act, 1957

The Patent Act, 1970

Indian Patents and Design Act, 1972

The Trademarks Act, 1999

Biotechnology Patent Facilitating Cell (BPFC)

Foundation of Biotechnology Awareness and Education (FBAE)

National Research Development Corporation (NRDC)

National Guidelines for Stem Cell Research (2013)

Tamil Nadu Biotechnology Policy 2014

Biotechnology Policy 2015-2020, Andhra Pradesh

Source: Ernst & Young, TechSci Research

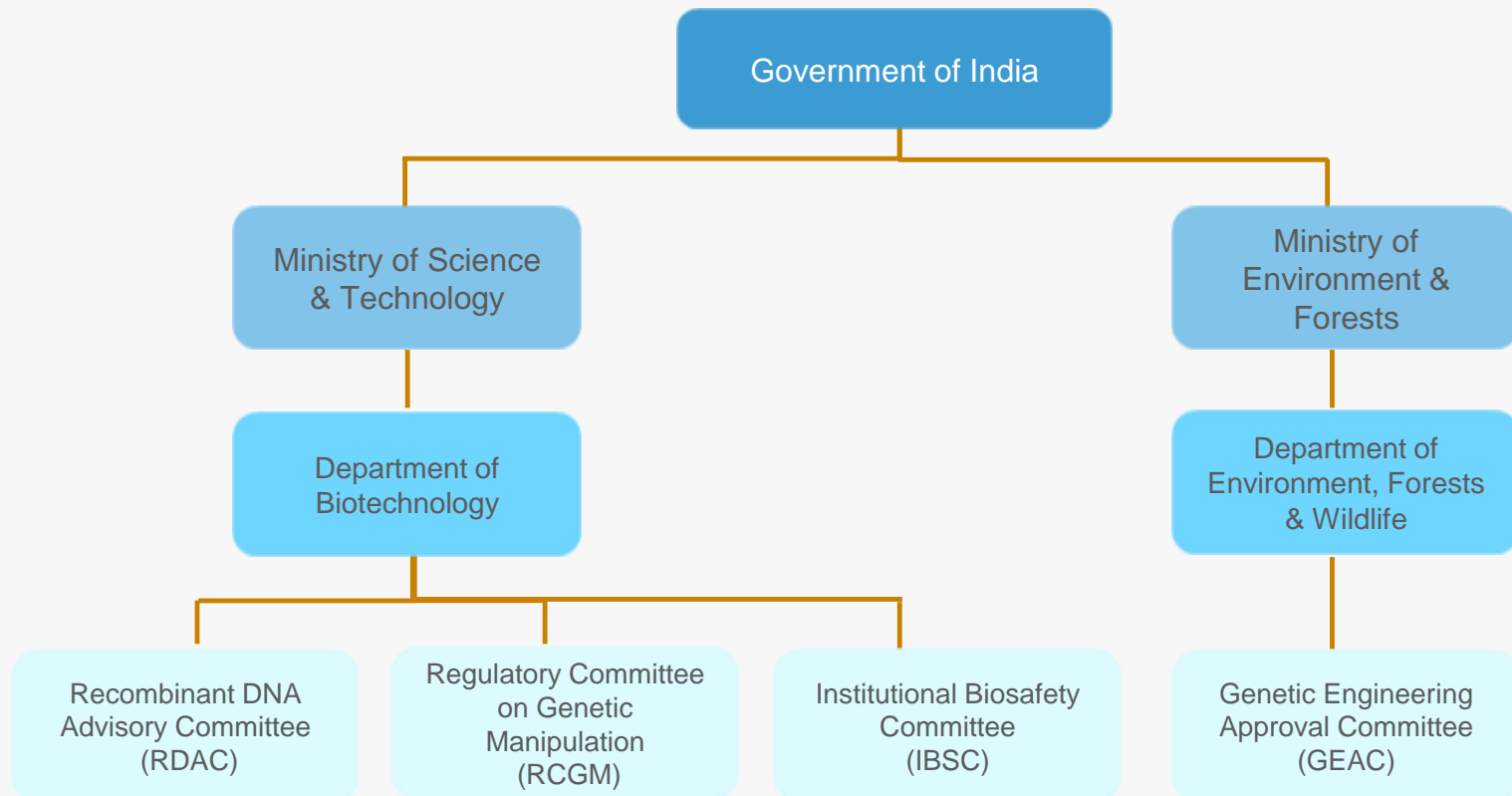
Notes: BIPP - Biotechnology Industry Partnership Programmes,

SBIRI - Small Business Innovation Research Industry,

BIRAC - Biotechnology Industry Research Assistance Council,

IP - Intellectual Property

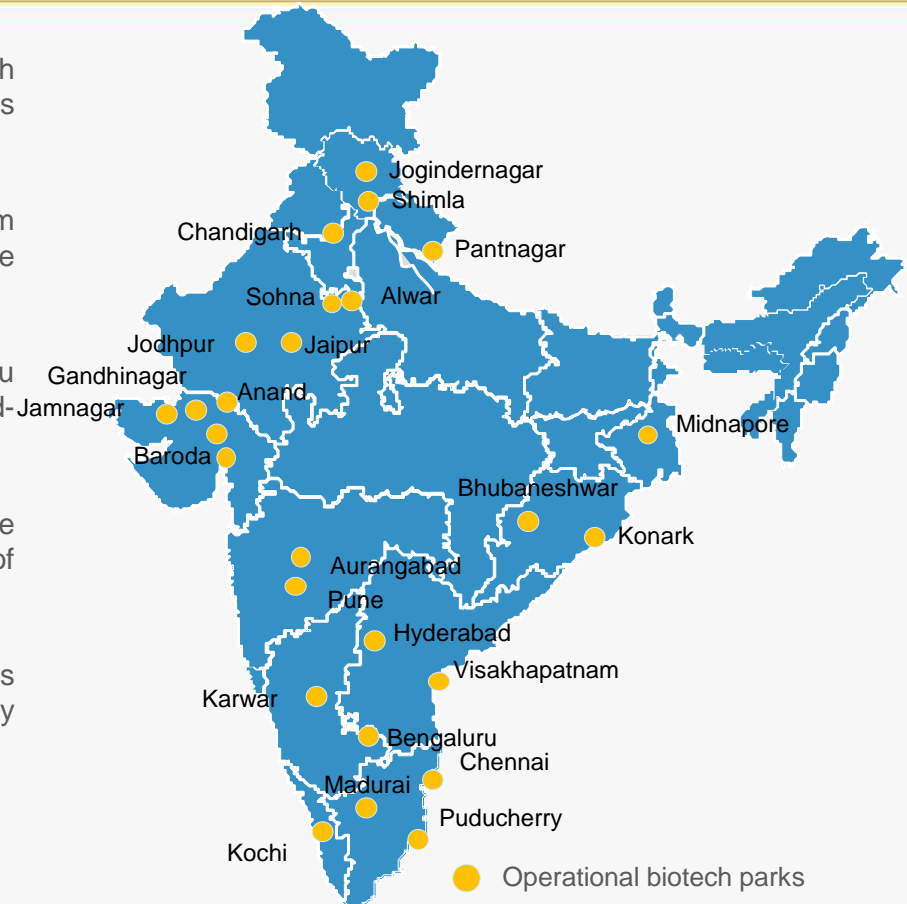
REGULATORY FRAMEWORK OF THE INDIAN BIOTECH SECTOR



Source: Policy and rules, Department of Biotechnology website, TechSci Research

SOLID INDUSTRY INFRASTRUCTURE WOULD DRIVE GROWTH

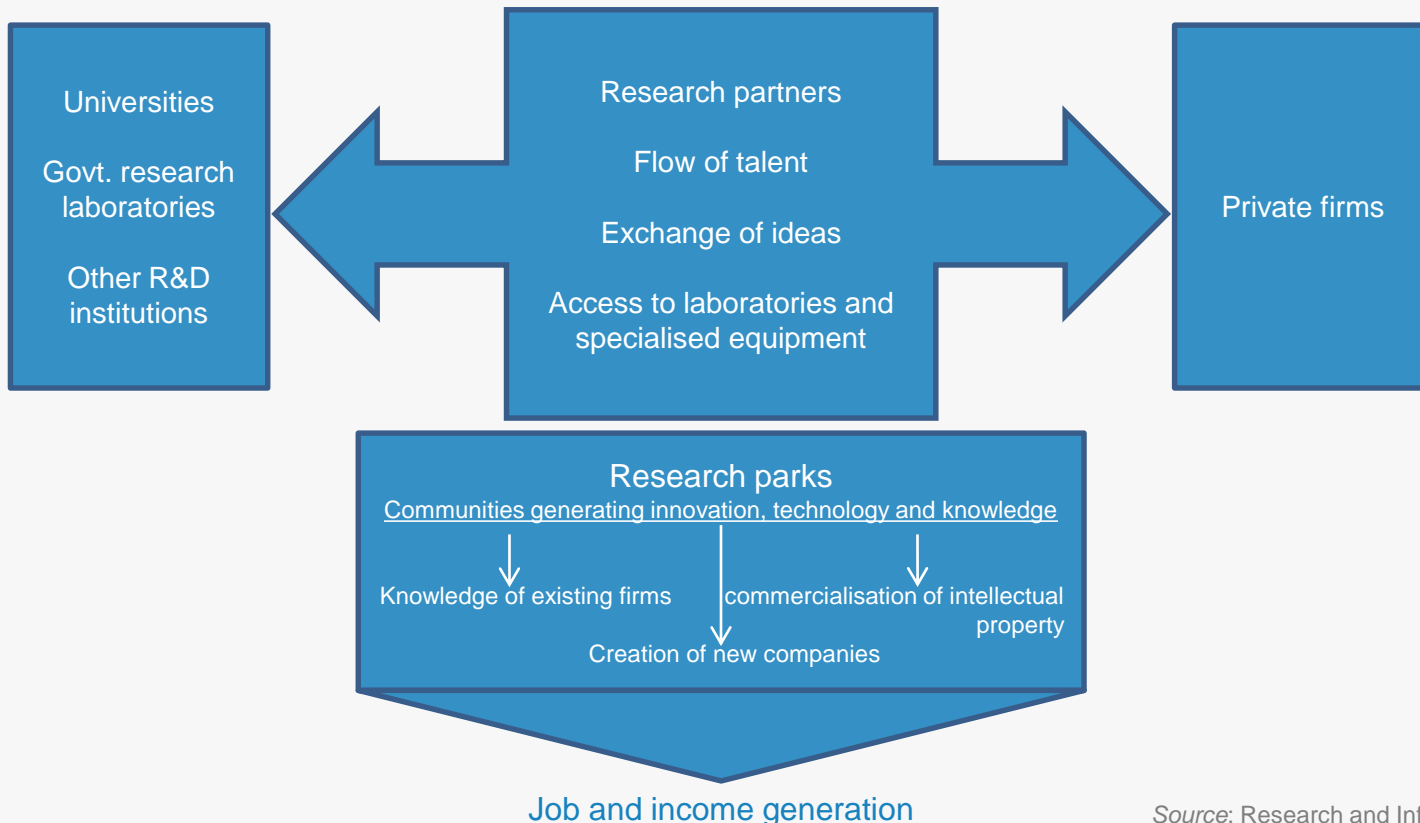
- * The 12th Five Year Plan aims to set up 3–5 bio-clusters with technology incubators, technology parks, innovation centres and entrepreneurship development units
- * Biotechnology infrastructure is witnessing a shift from traditional clusters to specialised industrial infrastructure such as biotech or science parks
- * States such as Andhra Pradesh, Maharashtra, Tamil Nadu and Kerala have been early movers in establishing world-class biotech parks and clusters
- * Investors such as TCG Bio-pharma and Alexandria have significantly contributed to the establishment of biotechnology-related infrastructure in India
- * Science and Technology Department has acquired 10 acres of land in Jammu & Kashmir to set up first biotechnology park in the state.



Source: Press Information Bureau, TechSci Research

CONCEPT OF BIOTECH PARK

- * The flow of job and income generation in biotechnology, through involvement of public and private initiatives with proper utilisation of available resources, is explained in the following diagram:



Source: Research and Information System for Developing Countries (RIS), TechSci Research

HIGH-END RESEARCH INFRASTRUCTURE CREATES SCOPE FOR INNOVATION

- * Fellowships rose from 100 to 250 per year for PhD students, in addition to 100 postdoctoral and 50 biotechnology overseas associateships
- * Government provided grant-in-aid to the industry for R&D in certain diseases such as malaria and leishmaniasis or kala-azar

Details of key biotechnology parks in India

Parks	City	Area (in acres)
Shapoorji Pallonji Biotech Park	Hyderabad	300
ICICI Knowledge Park	Hyderabad	200
International Biotech Park	Pune	103
Lucknow Biotech Park	Lucknow	20
Golden Jubilee Biotech Park	Chennai	8
Ticel Bio Park	Chennai	5

List of Biotech Parks at Developing Stage

Parks	City	Area (in acres)
Guwahati Biotech Park	Assam	700
KINFRA Biotech Park	Kerala	75
Bio Pharma-IT Park,	Odisha	64.61
Bangalore Biotech Park	Karnataka	53

Key research institutes in India

Central Drug Research Institute (CDRI), Lucknow
National Institute of Pharmaceutical Education and Research (NIPER), Mohali
Indian Institute of Chemical Technology (IICT), Hyderabad
Centre for Cellular & Molecular Biology (CCMB), Hyderabad
Indian Institute of Chemical Biology (IICB), Kolkata
Indian Toxicology Research Institute (ITRI), Lucknow
Institute of Genomics and Integrative Biology (IGIB), New Delhi
Institute of Microbial Technology (IMTECH), Chandigarh
National Chemical Laboratory (NCL), Pune
National Centre for Biological Sciences (NCBS), Bengaluru
Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru
Indian Institute of Science (IISc), Bengaluru
National Institute of Immunology (NII), New Delhi

Source: Research and Information System for Developing Countries (RIS), TechSci Research, "Mid-term appraisal"

STRONG INFLOW OF FOREIGN INVESTMENT

Date announced	Acquirer name	Target name	Value of deal (USD million)
Oct 2015	Recipharm	CMO Nitin Lifesciences	109.92
July 2015	Lupin Limited	Gravis Pharmaceuticals LLC	800
Dec 2014	Leaders Group Asia Ltd	Dr Datsons Labs Ltd	-
Oct 2014	B Braun Singapore Pte Ltd	Ahlcon Parenterals (India) Ltd	7.89
May 2014	Cancer Genetics Inc	Bioserve Biotechnologies	1.9
May 2014	Anglo Gulf Ltd	SciGen BioPharma Pvt Ltd	7.00
Jan 2014	Lotus Pharmaceutical Co Ltd	Alvogen Pharma India Pvt Ltd	10.00
Oct 2013	Innovation Software Exports	Agrata Biotech Ltd	-
May 2013	Bio Harvest Pte Ltd	Camson Bio Technologies Ltd	51.06
Dec 2012	Malabar Trading Co Ltd	SPL Biotech Pvt Ltd	-
Oct 2012	GE Equity International	Syngene International Ltd	302.13
Jun 2012	Nandan Cleantec PLC	Xtraa Cleancities Infra	-
Mar 2012	Origio A/S	Trivector Scientific Pvt Ltd	8.61
Aug 2011	DMV-Fonterra Excipients GmbH	Brahmar Cellulose Products	-
Aug 2011	Arvind Remedies Ltd	Undisclosed Pharmaceutical Co	-

Source: Thomson One Banker, TechSci Research



OPPORTUNITIES

HUGE OPPORTUNITIES FOR INNOVATION IN AGRICULTURE/HEALTHCARE

Vaccines

- Vaccines and recombinant therapeutics are the sectors driving the biotechnology industry's growth in India
- Newer therapies are anticipated to be launched in the next few years; prominent among these are monoclonal antibodies products, stem cell therapies and growth factors
- The country's huge population makes it among the world's largest markets for vaccines. In 2015, Bharat Biotech launched 'Rotavac' vaccine in India, three doses of the vaccine can prevent the Rotavirus diarrhea in infants.

Bioactive therapeutic proteins

- Protein and antibody production and fabrication of diagnostic protein chips are promising areas for investment
- Stem cell research, cell engineering and cell-based therapeutics are other areas, where India can cash its expertise

Agriculture sector

- India has the potential to become a major producer of transgenic rice and several Genetically Modified (GM) or engineered vegetables
- Hybrid seeds, including GM seeds, represent new business opportunities in India based on yield improvement

Intellectual Property

- Using the patent system as a mechanism to control drug pricing forestalls making the difficult decisions about necessary investment in the healthcare system, but does not deal with the underlying issues.

Source: India Law Offices, TechSci Research

HUGE OPPORTUNITIES FOR INNOVATION IN AGRICULTURE/HEALTHCARE

Bio services Sector

- Beyond biotherapeutics, the bioservices sector represents an area of significant promise for India because of its skilled labor force, attractive costs, and access to major markets in Asia.
- India's bioservices sector includes global contract research organisations, such as Quintiles, as well as Indian companies including GVK Bio, Jubilant Biosys, and Advinus.

Bio Pharmaceutical Industry

- As the cost of bringing new molecules from discovery to market continues to rise, the global biopharmaceutical industry is seeking ways to improve efficiency.

Manufacturing

- Manufacturing is also an area where India is leveraging its cost-competitiveness.
- India has the opportunity to replicate in biologics the same type of success it has had with small molecule drugs.
- As on August 2015, Indian Immunologicals Ltd (IIL) plans to set up a new vaccine manufacturing facility in Pondicherry with an investment of USD47.99 million

Bioinformatics

- The convergence of the life sciences with information technology is creating a particular opportunity for India.
- The country has well-established strengths in the information technology area, and with the advent of low-cost, whole genome sequencing and the growing role of molecular diagnostics in both precision and preventive medicine, there is a proliferation of data creating demand for bioinformatic analysis.

Source: India Law Offices, TechSci Research, Ministry of External Affairs

OUTSOURCING OPENS UP FURTHER AVENUES FOR GROWTH OF BIOTECH

Contract research

- The R&D sector has huge potential; many opportunities have been created with a number of foreign companies investing in this sector
- Indian pharmaceutical companies possess competitive skills in chemical synthesis and process engineering; the companies can leverage these skills to develop new chemical entities

Clinical trials

- India offers a suitable population for clinical trials because of its diverse gene pools, which cover a large number of diseases
- Cost effectiveness, competition, and increased confidence on capabilities and skill sets have propelled many global pharmaceutical companies to increase their clinical research investment in the nation

International collaboration

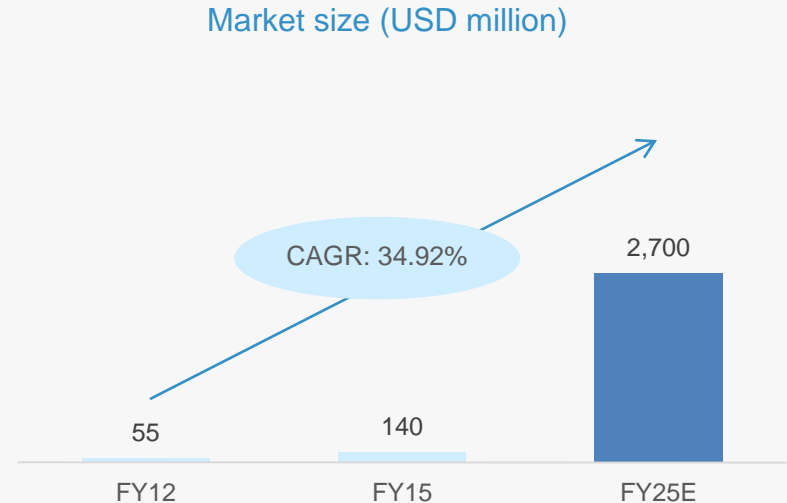
- Memorandum of Understanding (MOU) have been signed with Denmark and Finland and joint call for proposals have been issued
- Joint projects have also been funded with the Biotechnology and Biological Sciences Research Council (BBSRC), UK
- New agreements on vision research with National Institutes of Health (NIH), USA and an amendment to the agreement with Contraceptive Research and Development Programme (CONRAD)
- In 2015, DBT announced Indo-Australian Gold Fellowships to support researchers to undertake collaborative research project in Australia for 24 months.

Others

- Other potential areas of development include medicinal and aromatic plants, animal biotechnology, aquaculture and marine biotechnology, seri biotechnology, stem cell biology, environmental biotechnology, biofuels, biopesticides, human genetics, and genome analysis

BIOINFORMATICS TO GROW CONSIDERABLY

- * India was the first country in the world to establish a Biotechnology Information System (BTIS) network in 1987. This facilitated development of bioinformatics that has provided support to the biotechnology sector
- * Bioinformatics research is poised to become one of the fastest emerging markets in India
- * Bioinformatics is estimated to rise at a CAGR of 34.92 per cent to USD2.7 billion during FY12–25
- * India currently has close to 10 per cent of the global professional and skilled bioinformaticians
- * With 10 per cent of the global professional and skilled bioinformaticians, Indian bioinformatics companies can play a significant role in critical areas such as data mining, mapping and DNA sequencing
- * There is also opportunity in functional genomics, proteomics and molecule design simulation

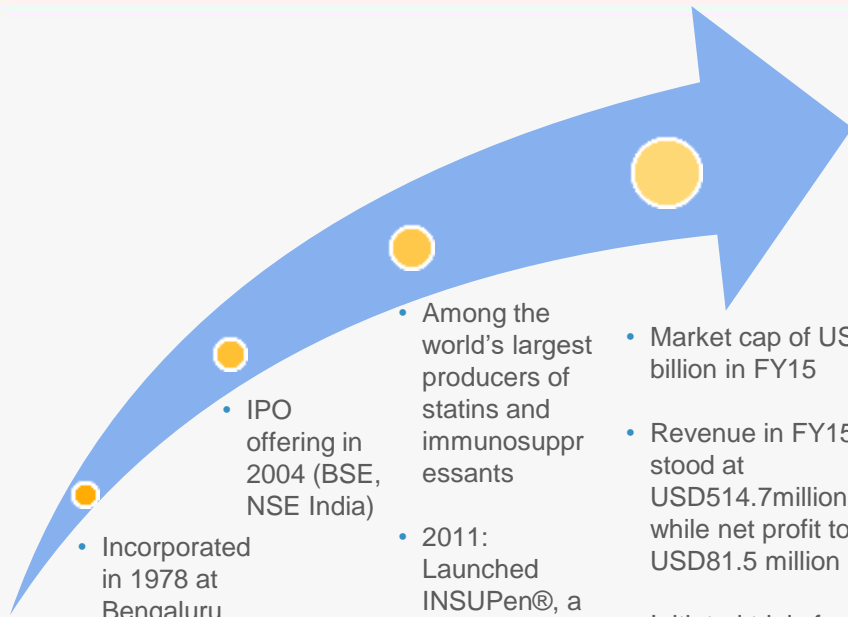


Source: Deptt. of Biotechnology,
Marketresearch, ABLE, TechSci Research
Note: E - Estimates



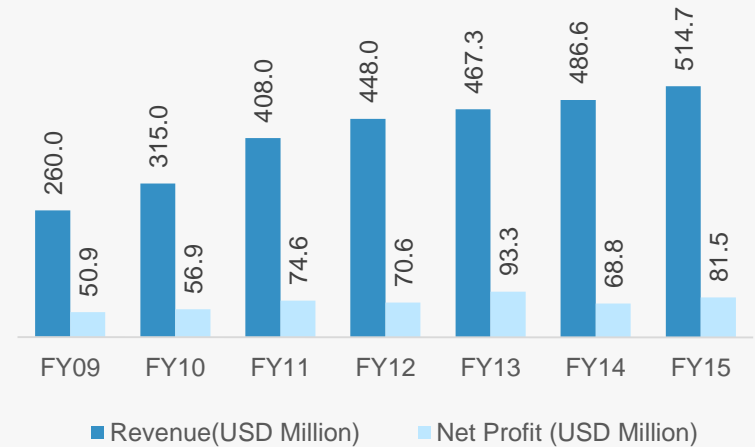
SUCCESS STORIES

BIOCON: AN EARLY MOVER IN THE GLOBAL BIOTECH MARKET



- Incorporated in 1978 at Bengaluru, India
- IPO offering in 2004 (BSE, NSE India)
- Among the world's largest producers of statins and immunosuppressants
- 2011: Launched INSUPen®, a convenient and affordable reusable insulin delivery device
- Market cap of USD1.5 billion in FY15
- Revenue in FY15 stood at USD514.7million while net profit totaled USD81.5 million
- Initiated trials for IN-105 (oral insulin program) in the US
- Tied-up with Quark Pharmaceuticals to develop novel siRNA-based therapeutics
- Partnered with Advaxis to develop a novel cancer immunotherapy

Revenue and net profit (USD million)

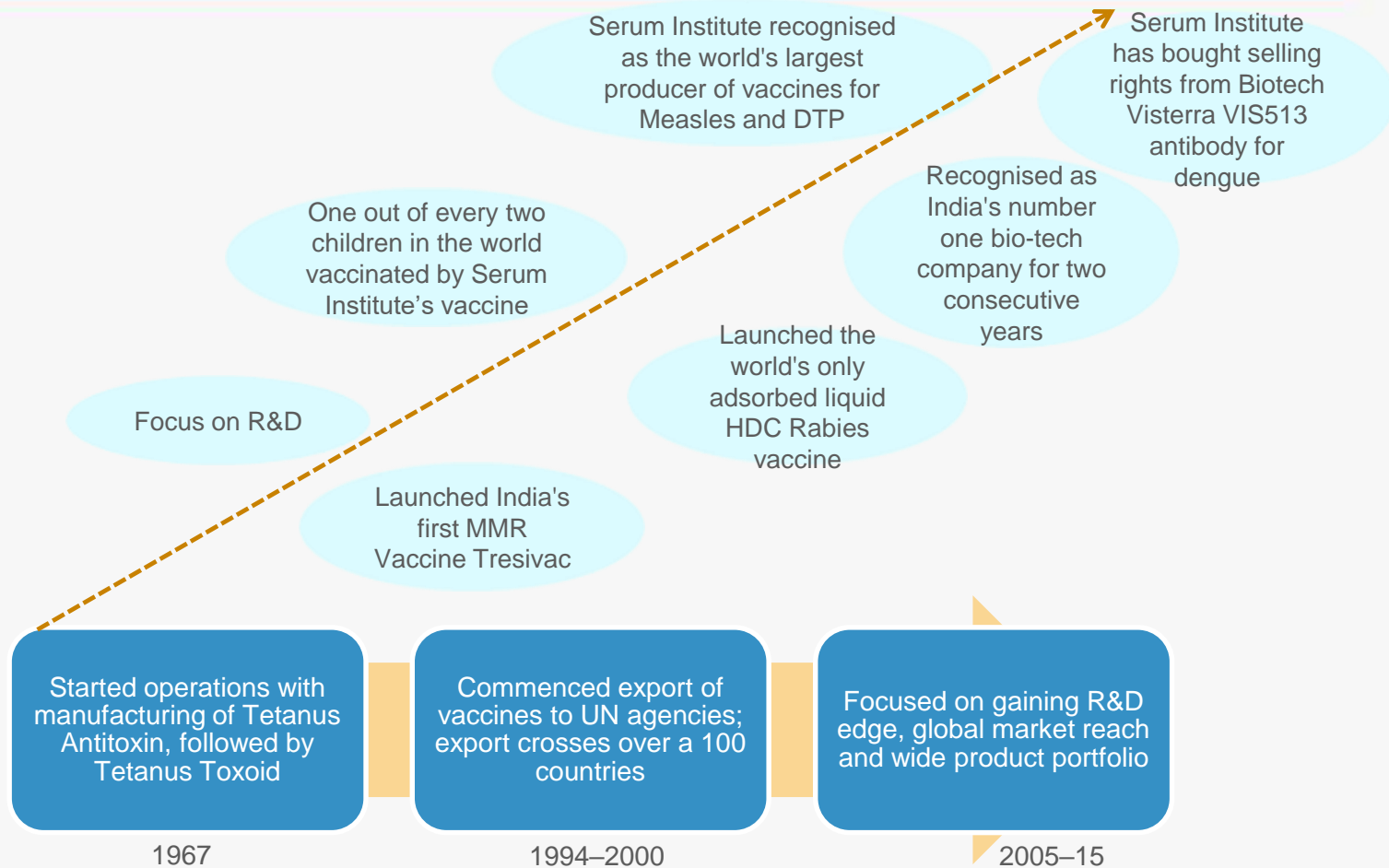
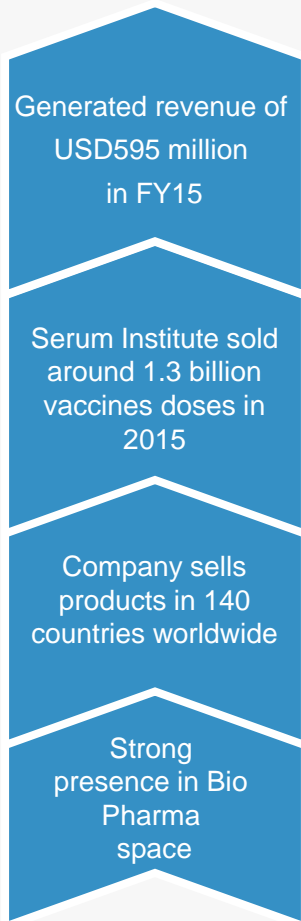


Biocon's position in the Indian market during FY13–15

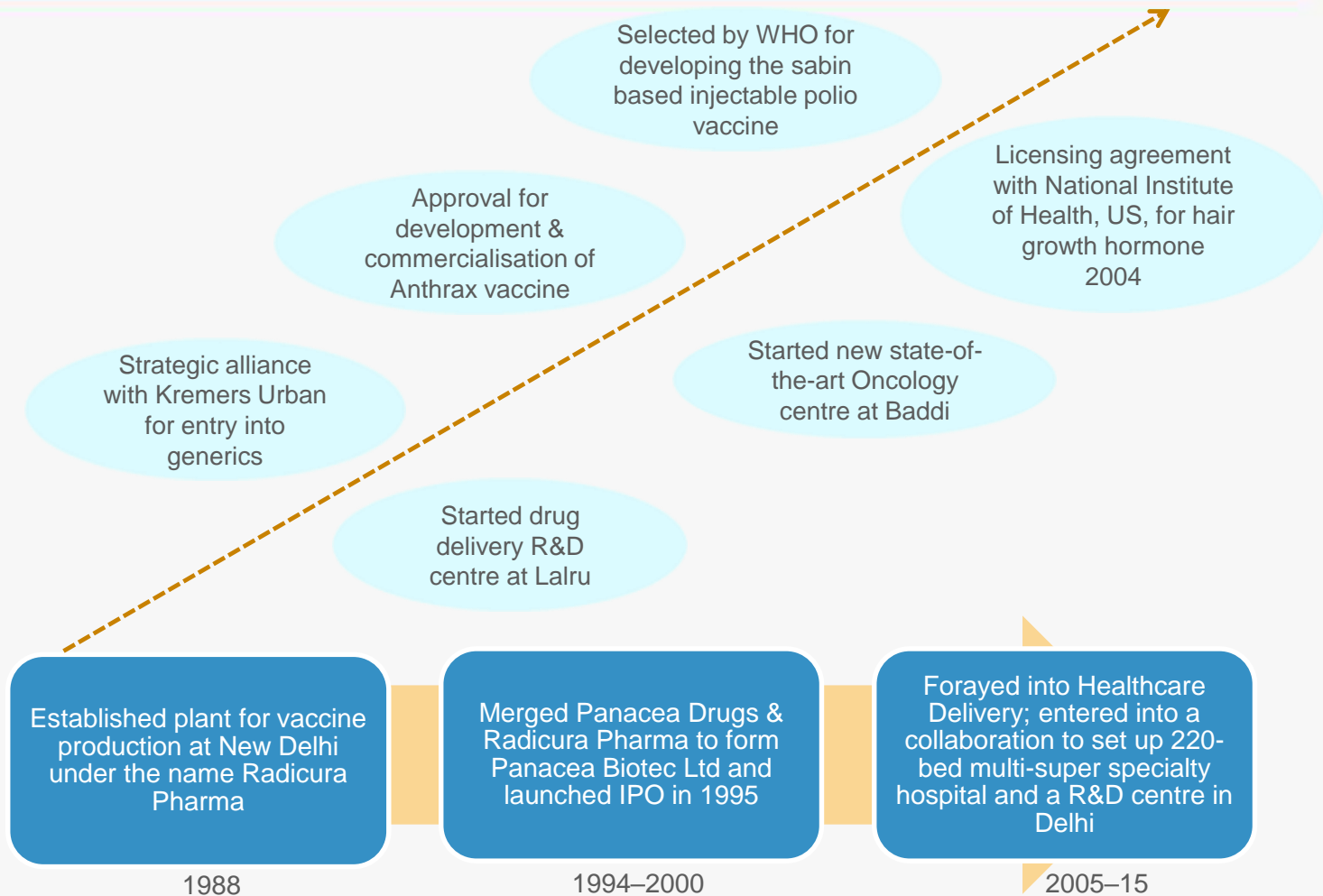
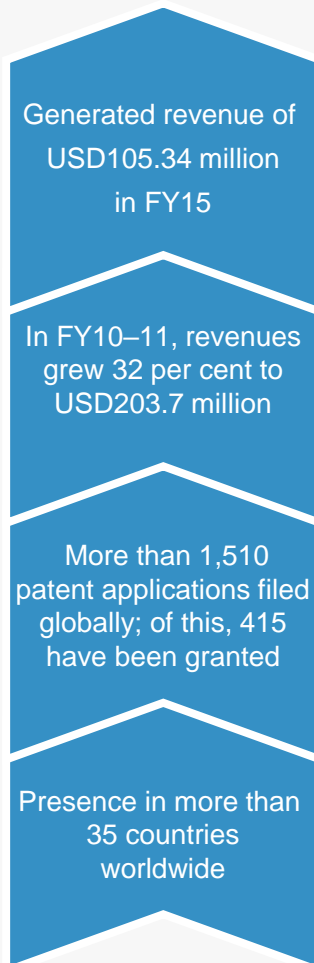
- Biocon received an award: 'WHO- India Public Health Champion Award 2015'
- Ranked 1st among Indian Insulin companies
- Ranked 1st in the Glargine vial market
- Ranked 3rd in the 40 IU Insulin market
- Ranked 4th in overall Insulin market
- Ranked 6th among the Top 10 global biotech employers

Source: Biocon Annual Report 2015

SERUM INSTITUTE OF INDIA: GAINING GLOBAL GROUND



PANACEA BIOTECH: FOCUS ON INNOVATION AND R&D



Source: Company website, TechSci Research



USEFUL INFORMATION

INDUSTRY ASSOCIATIONS

Association of Biotechnology Led Enterprises (ABLE)

123/C, 16th Main Road, 5th Cross, 4th Block
Near Sony World Showroom/Headstart School
Koramangala, Bengaluru – 560034
Phone: 91 80 41636853 25633853
E-mail: info@ableindia.org
Website: www.ableindia.org

All India Biotech Association (AIBA)

"VIPPS Center" 2. Local Shopping Centre Block EFGH, Masjid Moth,
Greater Kailash-II, New Delhi-110048
Tel: 91 11 29211487 (Direct), 29220546/547
Fax: 91 11 29223089, 29229166
Email: unmalik@aibaonline.com
Website: www.aibaonline.com

- * **Bt:** Bacillus thuringiensis
- * **CAGR:** Compound Annual Growth Rate
- * **CRO:** Contract Research Organisation
- * **DNA:** Deoxyribonucleic acid
- * **FYP:** Five Year Plan
- * **GCP:** Good Clinical Practice
- * **INR:** Indian Rupee
- * **NBTB:** National Biotechnology Board
- * **OAD:** Oral Anti-diabetic Drugs
- * **R&D:** Research And Development
- * **FY:** Indian Financial Year (April to AUGUST)
 - * So FY10 implies April 2009 to AUGUST 2010
- * **USD:** US Dollar
- * Wherever applicable, numbers have been rounded off to the nearest whole number

EXCHANGE RATES

Exchange rates (Fiscal Year)

Year	INR equivalent of one USD
2004-05	44.81
2005-06	44.14
2006-07	45.14
2007-08	40.27
2008-09	46.14
2009-10	47.42
2010-11	45.62
2011-12	46.88
2012-13	54.31
2013-14	60.28
2014-15	61.06
2015-16(Expected)	61.06

Exchange rates (Calendar Year)

Year	INR equivalent of one USD
2005	43.98
2006	45.18
2007	41.34
2008	43.62
2009	48.42
2010	45.72
2011	46.85
2012	53.46
2013	58.44
2014	61.03
2015(Expected)	63.72

Source: Reserve bank of India,
Average for the year

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