

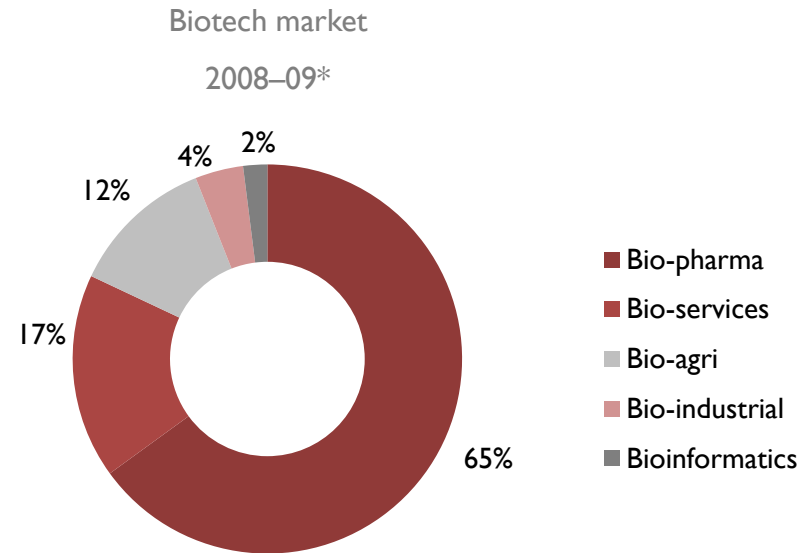


BIOTECHNOLOGY

September 2009

Market overview

- The contribution of the Indian biotech industry to the global biotech industry is two percent.
- The industry in 2008–09 clocked US\$ 2.67 billion registering a 18 percent growth (in value) over the previous fiscal.
- Growth has been mainly fuelled by rise in domestic business, exports and new product innovations.
- The sector employs approximately 20,000 scientists, and over 325 companies drive it towards further growth



Source: Top 20 biotech companies, Biospectrum industry survey, June 2009, p 14; Ernst & Young analysis.

*Numbers may appear inconsistent because of rounding off.

Market overview

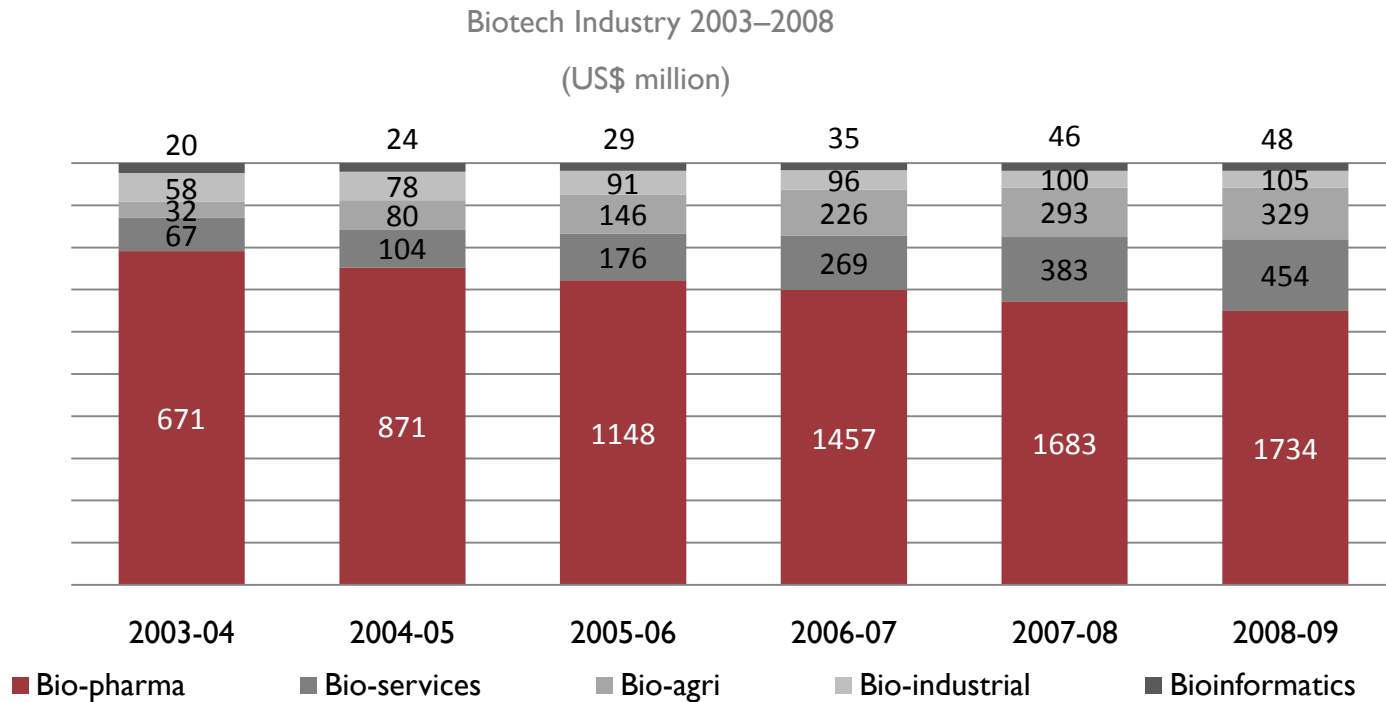
- India is among top 12 biotech markets globally.
- India ranks third in the Asia-Pacific region, after Japan and Korea.
- Indian market is expected to touch US\$ 5 billion by 2010 and US\$ 25 billion by 2015.

Segment	2008-09 Revenue (in US\$ mn)	Contribution (in percent)
Biopharma	1734.26	64.95
Bioservices	453.64	16.99
Bioagri	328.68	12.31
Bioindustrial	105.16	3.94
Bioinformatics	48.4	1.81

Source: Top 20 biotech companies, Biospectrum industry survey, June 2009, p.14; Ernst & Young analysis

*Numbers may appear inconsistent because of rounding off.

Biotech Industry



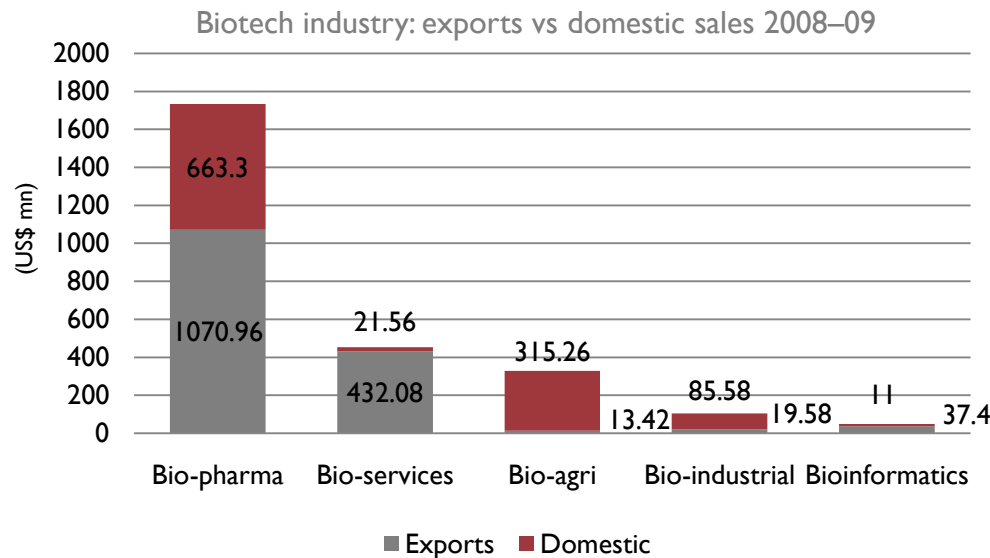
Source: Top 20 biotech companies, Biospectrum industry survey, June 2009, p.12, 13; Ernst & Young analysis

Numbers may appear inconsistent because of rounding off.

Exports

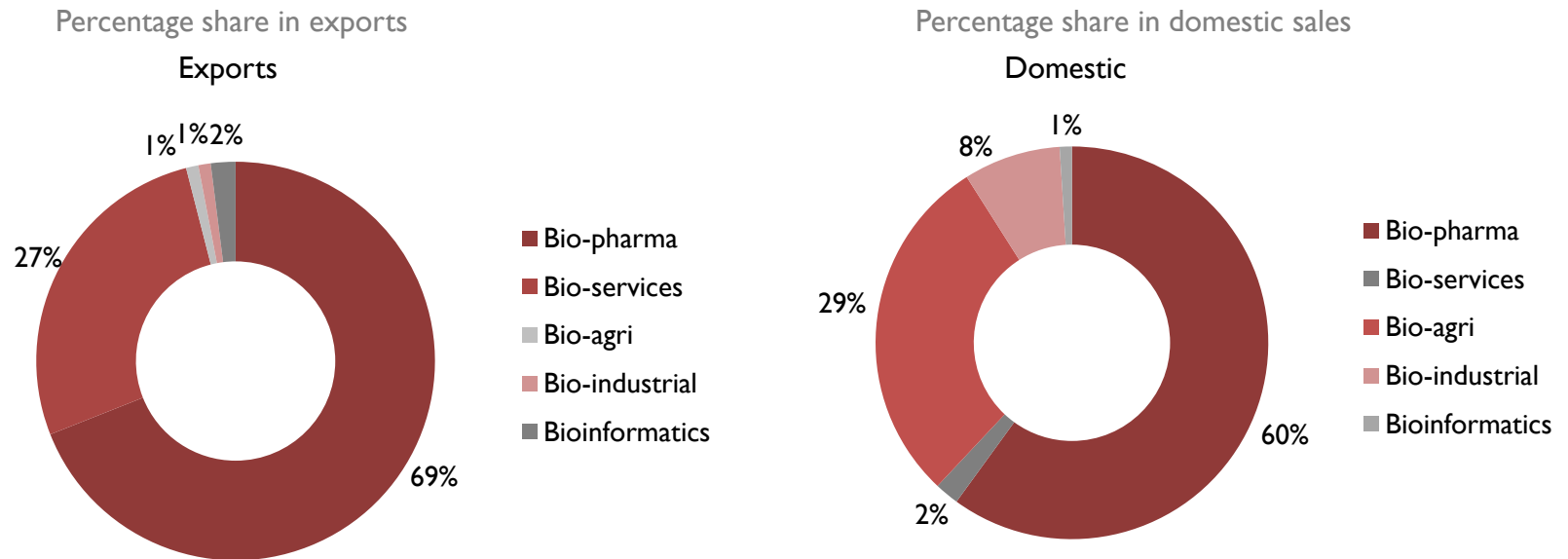
- Revenues from biotech exports were US\$ 1.5 billion in 2008-09 which is 59 percent of total biotech industry revenues.
- Biopharma exports accounted for over 68 percent of the total industry, while bioservices sector contributed 27 percent of share in exports.

Biotechnology sector exports from India 2008–2009 (US\$ mn)	
Segment	Revenues
Biopharma	1070.96
Bioservices	432.08
Bioagri	13.42
Bioindustrial	19.58
Bioinformatics	37.4



Source: “Top 20 biotech companies,” Biospectrum industry survey, June 2009, p.14; Ernst & Young analysis
Numbers may appear inconsistent because of rounding off.

Share of different segments in export and domestic sales 2008–09



Source: Top 20 biotech companies, Biospectrum industry survey, June 2009, p.14; Ernst & Young analysis

Numbers may appear inconsistent because of rounding off.

Biotech clusters in India

- India’s main bio-clusters are located in Bangalore, Hyderabad, Pune-Mumbai and Ahmedabad-Vadodara.
- Some of the tier II and tier III cities such as Coimbatore, Goa, Mysore, Madurai, Nagpur and Thiruchirapalli are also emerging as promising biotech destinations.

Western region

- Comprises the Pune-Mumbai, Goa and Ahmedabad-Vadodara clusters.
- Accounted for 43 percent of India’s biotech business with revenues of US\$ 1157 million.

Biotech Revenues in US\$ million				
Cluster	2008-09	2007-08	% share in 2008-09	y-o-y growth
West	1157.3848	979.5214	43%	18%
South	1118.4844	961.0986	42%	16%
North	394.2708	319.66	15%	23%
	2670.14	2260.28		

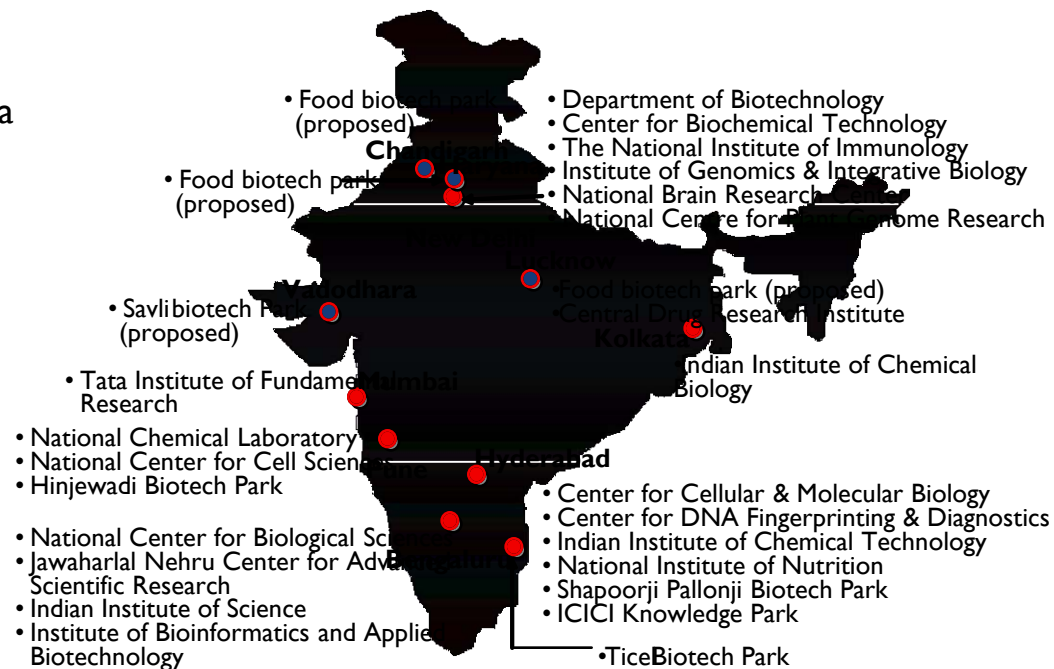
Source: “Top 20 biotech companies,” Biospectrum industry survey, June 2009, p.26; Ernst & Young analysis

Numbers may appear inconsistent because of rounding off.

Biotech clusters in India

Southern region

- Comprises of clusters in Karnataka, Andhra Pradesh and Tamil Nadu
- In 2008-09, Karnataka generated revenues of US\$ 557 million recording a growth of 20 percent



Source: "Top 20 biotech companies," Biospectrum industry survey, June 2009, p.26; Ernst & Young analysis

Numbers may appear inconsistent because of rounding off.

Biopharmaceuticals

- Largest contributor to revenues of the biotech industry. Recorded sales in excess of US\$ 1.72 billion in 2008–09.
- Accounted for 67 percent of the total industry revenues, registering 16 percent growth over the last fiscal.

Leading biopharma companies 2008-09		
Company	Revenue (US\$ mn) 2008–09	Percentage change over 2007–08
Serum Institute of India	245.08	12.87%
Biocon	200.71	4.04%
Panacea Biotec	131.37	-11.98%
NovoNordisk	72.60	26.92%
Shantha Biotech	54.34	64.67%

Source: “Top 20 biotech companies,” Biospectrum industry survey, June 2009, p.22,23; Ernst & Young analysis
Numbers may appear inconsistent because of rounding off.

Biopharmaceuticals

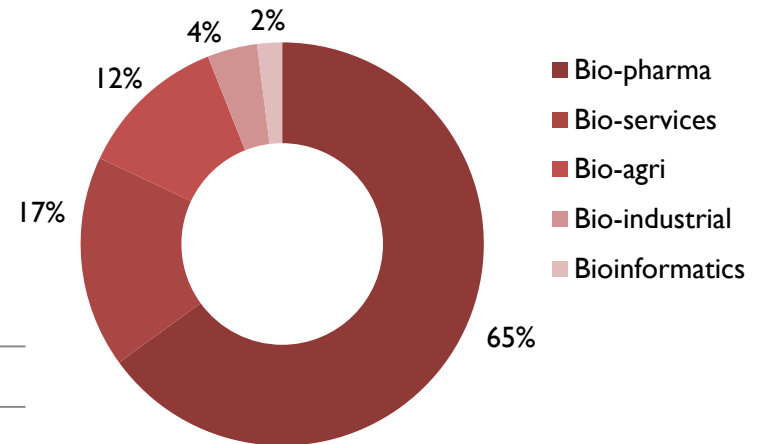
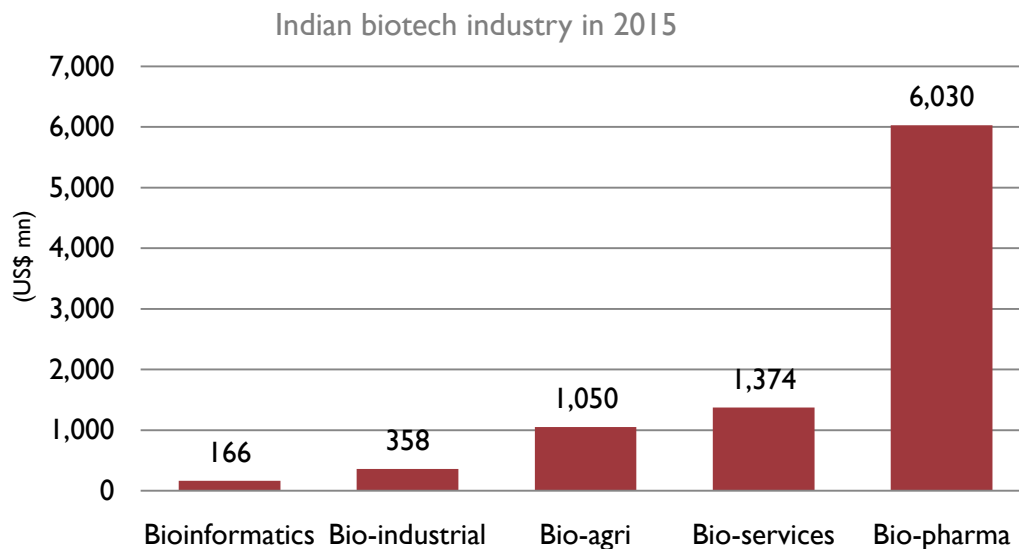
- Top five players accounted for 40 percent of the biopharma market.
- Of the top 10 biopharma companies, seven were vaccine players.

Segment-wise revenues (in US\$)				
Sector	2005 (US\$ mn)	2005 (US\$ mn)	% change	% share in 2006
Vaccine	570	734	30.41	51
Diagnostics	220	231	4.97	16
Therapeutics	156	176	13.28	12
Others	220	303	51.46	21
Total bio Biotech pharma revenues	1146	1453	26.87	100

Source: "Top 20 biotech companies," Biospectrum industry survey, June 2009, p.22,23; Ernst & Young analysis
Numbers may appear inconsistent because of rounding off.

Indian biotech industry: current status and forecast

In 2008-09, revenues for the biotech industry stood at US \$ 2.67 billion.



Source: Top 20 biotech companies, Biospectrum industry survey, June 2009, p.14, Ernst & Young analysis

Numbers may appear inconsistent because of rounding off.

Biopharma: Vaccines

- Vaccines accounted for 51 percent of the biopharma market with revenues worth US\$ 743 million in 2006.
- Serum Institute is India's leading vaccine company with revenues of US\$ 245 million in 2008-09.
- India is one of the largest producers of traditional vaccines, considered the 'vaccine capital' of the world.
- Indian companies have also been focusing on under-served markets like HIV and Japanese Encephalitis and high-value combination vaccines.

Leading vaccine companies 2008-09	
Company	Revenue in 2008-09 (in US\$ mn)
Serum Institute of India	245.08
Panacea Biotec Ltd	131.37
Shantha Biotech	54.34
Bharat Biotech	51.51
Indian Immunologicals Ltd	50.92

Source: Top 20 biotech companies, Biospectrum industry survey, June 2009, p.22,23; Ernst & Young analysis

Biopharma: Diagnostics

- Diagnostics account for 16 percent of the biopharma market with revenues of US\$ 231 million.
- Tulip is the leading diagnostics company in India with revenues at US\$ 40 million in 2006-07.
- There are over 50 diagnostics companies in India including multinationals (MNCs).
- Top companies have consolidated their market presence and are growing at 15 percent to 20 percent.
- Many diagnostics products in India are imported, but increased local activity has made the market more competitive.

Leading diagnostics companies	
Company	Revenue in 2006-07 (in US\$ mn)
Tulip	40
TransAsia Biomedical	37
Biotech Bayer	18
Span Diagnostics	13
Becon Diagnostics	5
Others	118
Total revenues	231

Source: "Top 20 biotech companies," Biospectrum industry survey, June 2009, p.22,23; Ernst & Young analysis
Numbers may appear inconsistent because of rounding off.

Biopharma: Therapeutics

- Therapeutics generated revenues of US\$ 176 million in 2006 with a growth of 13 percent
- Therapeutics remain the thrust in Indian R&D with human insulin being the most common area of research.
- Huge opportunity in biosimilars is opening up for Indian companies with regulatory approval pathways in Europe and US becoming clearer.

Human insulin

- Largest contributor to the therapeutics market with revenues of US\$ 88 million.
- Large opportunity for insulin manufacturers.
- Over 37.5 million people suffer from diabetes in India, creating a huge opportunity.
- MNCs such as Novo Nordisk, Eli Lilly and Aventis Pasteur currently dominate the market.
- Novo Nordisk is the market leader with revenues of US\$ 54 million.

Biopharma: Therapeutics

Plasma proteins

- Plasma proteins is an emerging category in India.
- Over 100,000 people in India suffer from haemophilia (India has 25 percent of the world's haemophiliac population).
- India has been sourcing plasma proteins from MNCs such as Baxter.
- There is tremendous market potential for manufacturing plasma proteins locally and indigenously.
- Reliance Life Sciences is the first company to tap into the plasma protein market.

Monoclonal Antibodies (mAbs)

- mAbs is a fast-growing segment, especially in oncology and auto-immune diseases.
- India has 3 million cancer patients and 700,000 new cases every year.
- Biocon has an international collaboration for anti-EGFR mAbs which would be used to treat cancer of the neck and head.
- Serum Institute has tied up with US-based Akorn for development of rabies mAbs with exclusive distribution rights.

Bioservices

- Bioservices is the second largest contributor to the industry with a 17 percent share of the industry.
- It accounted for 27 percent of the total exports in 2008-09.
- Syngene is a leading company with revenues of US\$ 49.4 million in 2008-09 and an impressive growth of 28 percent.
- More than 70 companies in India are involved in bioservices.
- Global companies view India as a favourite destination for outsourcing services.
- India offers a US\$ 1 billion opportunity in clinical trials alone.

GVK Biosciences & Drug Development Solutions

- Drug Development Solutions (UK-based) has signed a long-term agreement with GVK Bio for providing clinical data management services for clinical trials

Source: "Top 20 biotech companies," Biospectrum industry survey, June 2009, p.14,22,23; Ernst & Young analysis
Numbers may appear inconsistent because of rounding off.

Bioservices

Bristol-Myers Squibb & Syngene

- A research collaboration agreement has been signed to enhance capabilities and service offerings.

GlaxoSmithKline & Tata Consultancy Services

- GSK signed a multi-million dollar contract with TCS to establish an R&D support centre in Mumbai.

Acunova Life Sciences & Kiecana Clinical Research

- KCR (Poland-based) formed a strategic regional alliance with Acunova Life Sciences for leveraging operations in South Asia, Europe, and Latin America.

Leading bioservices companies 2008-09	
Company	Revenue (US\$ mn) 2008-09
Syngene International	49.41
Vimta Labs	17.95
Lambda Therapeutic Research	6.60

Source: "Top 20 biotech companies," Biospectrum industry survey, June 2009, p.14,22,23; Ernst & Young analysis
Numbers may appear inconsistent because of rounding off.

Bioagri

- Bioagri generated revenues of US\$ 328.68 million in 2008-09, and grew at the rate of 24 percent.
- Top three companies (Rasi Seeds, Nuziveedu Seeds and Mahyco) account for 63 percent of the segment's total revenues.
- Bioagri is driven primarily by Bt cotton seeds
- In 2006-07, India overtook China in total area under Bt cotton cultivation —3.8 million hectares as opposed to China's 3.5 million hectares.
- 62 Bt cotton hybrids were approved for planting in 2006; 111 Bt cotton hybrids were approved for commercial cultivation by May 2007.
- About 15 GM crop products are being developed by both the public and private sector.

Leading bioagri companies 2008-09	
Company	Revenue (US\$ mn) 2008-09
Rasi Seeds	82.63
Nuziveedu Seeds	80.07
Mahyco	46.45
Ankur Seeds	17.68

Source: "Top 20 biotech companies," Biospectrum industry survey, June 2009, p.14,22,23; Ernst & Young analysis
Numbers may appear inconsistent because of rounding off.

Bioagri

Biodiesel

- The National Biofuel policy was approved by the Union Cabinet on 11 September, 2008.
- Biofuels is in its infancy, with only about 66 million gallons of ethanol utilised in ten Indian states.
- Domestic and foreign collaborations are expected to boost India's biodiesel production to one million tonnes per year in the next two to three years.
- India has developed high-yielding varieties of Jatropha seeds.
- The government has been testing bio-diesel in public transport locomotives and buses.
- Commercial bio-diesel production units have been set up by Southern Online Biotechnologies and Naturol Bioenergy Ltd

Source: "The Year that Was," BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009;

Numbers may appear inconsistent because of rounding off.

Bioagri

Biopesticides and biofertilizers

- In 2006, Biopesticides and bio-fertilisers were estimated to have a combined market value of US\$ 19.5 million in India.
- Phosphate-solubilising microorganisms market witnessed maximum growth among biofertilisers.
- Leading players include Biotech International, Excel, and Multiplex.
- Many research universities and institutes are pursuing research in bio-fertilisers, eg. University of Hyderabad, National Research Center for Plant Biotechnology, etc.

Bioinformatics

- Bioinformatics is a US\$ 48.4 million (2008-09) opportunity in India and is rapidly growing.
- Increasing number of investors are funding Bioinformatics in India, eg. Kotak Mahindra Bank, International Financial Corporation (IFC) etc.
- Department of Biotechnology (DBT) has taken initiatives to link 63 bioinformatic centres in India to promote networking of information resources.

Going global

- International client base for Indian bioinformatics companies has expanded rapidly.
- Indian companies cater to the National Institute of Health (NIH), National Institute for Cellular Biology (Dublin), David Eisenberg's research lab at DOE Institute for Genomics and Proteomics, UCLA etc.
- Pure play bioinformatics companies in India include players such Strand Life Sciences, Ocimum Biosolutions, Molecular Connections, Mascon Life Sciences etc.
- Three main areas of opportunity include integrated research application services, database services and discovery software, and software requirements of the biotech industry.

Source: "Top 20 biotech companies," Biospectrum industry survey, June 2009, p.14,22,23; Ernst & Young analysis

Bioindustrial

- Bioindustrial segment touched US\$ 105 million in 2008–09 witnessing a growth of 17 percent over the previous fiscal.
- About 15 companies in India are involved in the enzymes business.
- Top three bioindustrial companies accounted for 74 percent of the segment’s market value.
- Novozymes is the segment leader with revenues worth US\$ 55 million in 2008-09.
- Companies are focussing on new areas of application: food processing, agriculture, animal nutrition, dairy, aquaculture, marine, etc.
- Many opportunities exist in manufacturing industrial enzymes in India for export purposes.

Leading bioindustrial companies 2008-09	
Company	Revenue (US\$ mn) 2008–09
Novozymes South Asia	55.00
Advanced Enzymes	19.49
Zytex	3.08

Source: Top 20 biotech companies, Biospectrum industry survey, June 2009, p.14,22,23; Ernst & Young analysis

Numbers may appear inconsistent because of rounding off.

Key growth drivers and trends...(1/7)

Pharmaceutical companies are focussing on biotechnology

- Major pharmacos are diversifying into biotech, e.g., Ranbaxy, Cadila Healthcare, Lupin, Wockhardt, Dr. Reddy's(DRL) and Intas.
- Lupin Pharma has identified Biologics as a top priority for future expansion.

Direct investments from international biotech firms

- Foreign companies are increasingly making direct investments into Indian biotech.
- Avesthagen managed to raise around US\$ 36 million from Europe's Groupe Danone, Groupe Limagrain and two other strategic investors.
- Shantha Bioelectronics Ltd will receive close to US\$ 10 million from its major French partner Merieux Alliance
- Amgen has opened a wholly owned subsidiary, Amgen Technology in Mumbai.

Sources: Lupin's biological pursuit, BioSpectrum website, <http://biospectrumindia.ciol.com/>, accessed 15 September 2009

Sanofi-Aventis to take control of Shantha Biotechnics, Dow Jones International News, 14 September 2009, via Dow Jones Factiva;

Key growth drivers and trends...(2/7)

Indian players expand their capacities to global standards

- Companies are putting efforts into expanding facilities and capabilities to global standards for better access to partnerships.
- Biocon plans to set up a new plant worth US\$ 116 million in Visakhapatnam, Andhra Pradesh.
- Reliance Life Sciences (RLS) plans to invest US\$ 219 million into four new facilities for home-grown clinical and generic products.
- Reliance Life Sciences also plans to set up a world class Clinical Data Management Centre (CDM) in Bangalore.

Sources: Lupin's biological pursuit, BioSpectrum website, <http://biospectrumindia.ciol.com/>, accessed 15 September 2009

Sanofi-Aventis to take control of Shantha Biotechnics, Dow Jones International News, 14 September 2009, via Dow Jones Factiva;

Key growth drivers and trends...(3/7)

Collaborations and alliances

- An unprecedented surge has been observed in partnering activity as a means to enter new markets and expand competencies and capacities.
- RLS acquired a 74 percent stake in UK-based biotech company, GeneMedix, for about US \$ 31 million in 2007.
- Sanofi Pasteur acquired Shantha Biotechnics in August 2009
- Syngene has entered into a research partnership with international pharma player Bristol-Myers Squibb.
- Panacea Biotec acquired a 10 percent stake worth over US\$ 3.8 million in UK-based Cambridge Biostability Limited (CBL)

Sources: Lupin's biological pursuit, BioSpectrum website, <http://biospectrumindia.ciol.com/>, accessed 15 September 2009

Sanofi-Aventis to take control of Shantha Biotechnics, Dow Jones International News, 14 September 2009, via Dow Jones Factiva;

Key growth drivers and trends...(4/7)

Increasing government support for biotechnology

- The government is initiating various proactive reforms for the industry.
- It has implemented a National Biotechnology Development Strategy (NBDS) and is establishing a National Biotechnology Regulatory Authority (NBRA).
- DBT plans to invest US\$ 77 million BIPP (Biotech Industry Partnership Programme)

Sources:

"The Year that Was," BioSpectrum website, <http://biospectrumindia.ciol.com/>, accessed 14 September 2009

"A welcome move to secure the nation's intellectual property," BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

"India: Rise of a diagnostics superpower," BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

Key growth drivers and trends...(5/7)

Increased biotech funding for the Indian market

- Various global and domestic financial institutions have shown interest in investing in the biotech sector.
- In February 2009, India Venture invested US\$ 18 million in Tamil Nadu-based Kavery Medical while IFC invested US\$ 30 million in Max India
- Sabre Capital has a US\$ 100 million fund focussed on investing in mid size existing hospitals or in start-ups.

Sources:

"The Year that Was," BioSpectrum website, <http://biospectrumindia.ciol.com/>, accessed 14 September 2009

"A welcome move to secure the nation's intellectual property," BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

"India: Rise of a diagnostics superpower," BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

Key growth drivers and trends...(6/7)

Strengthening confidentiality and IP protection

- Lok Sabha has passed The Protection and Utilization of Public Funded Intellectual Property Bill, 2008
- Efforts are being made to increase the presence of judicial courts that deal with IP issues.
- Patent applications can be submitted in four locations in India.
- Strengthening IP has attracted international players to invest into the domestic market.

Sources:

"The Year that Was," BioSpectrum website, <http://biospectrumindia.ciol.com/>, accessed 14 September 2009

"A welcome move to secure the nation's intellectual property," BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

"India: Rise of a diagnostics superpower," BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

Key growth drivers and trends...(7/7)

Emerging areas: stem cell and nanotechnology

- Significant investments have been made into stem cell research.
- The Center for Cellular and Molecular Biology (CCMB) has entered into collaborations with Deccan Medical College (DMC) and Japan-based Nichi-in Center for stem cell research.
- DBT is setting up Centre for Stem Cell Research which has been approved by the Indian Council to conduct India's first ever multi-centric clinical trials with stem cells.
- Dabur Pharma developed the country's first indigenously developed nanotech-based chemotherapy agent, the first of its kind outside of USA.

Sources:

"The Year that Was," BioSpectrum website, <http://biospectrumindia.ciol.com/>, accessed 14 September 2009

"A welcome move to secure the nation's intellectual property," BioSpectrum website, http://biospectrumindia.ciol.com, accessed 14 September 2009

"India: Rise of a diagnostics superpower," BioSpectrum website, http://biospectrumindia.ciol.com, accessed 14 September 2009

Policy

Natural Biotechnology Development Strategy (NBDS)

- Developed by the government to accelerate further growth of the industry growth; goal is to make it a US\$ five billion industry by 2010.
- Key features include:
 - A national task force to establish model academic curricula
 - Scaling up of proven technologies like diagnostics and vaccines; scaling up infrastructure for R&D
 - Establishing a single window clearance mechanism
 - Financial support through incubator funds and incentives for R&D
 - Small Business Innovation Research Initiative (SBIRI)
 - National Biotechnology Regulatory Authority (NBRA)
 - Biotechnology parks

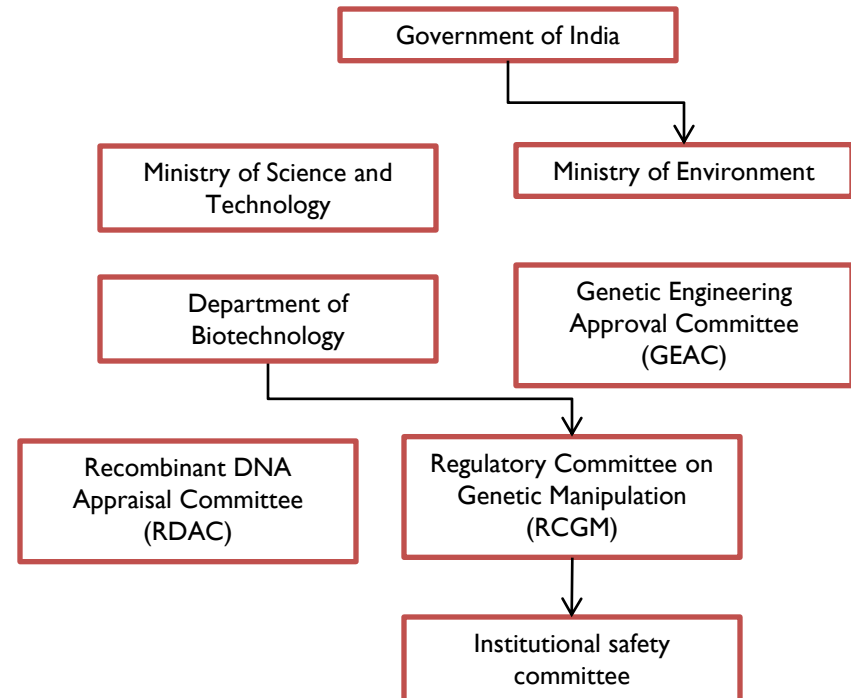
Policy

Regulatory framework

- The government has established a multi-regulatory structure for genetically modified (GM) crops and human health products.
- Key body under the Ministry of Science and Technology is Department of Biotechnology (DBT)

Budget 2009–10

- Five-year extension on incentive for R&D spend and 150 percent weighted average tax deduction
- Reduction in custom duty for lifesaving vaccines.



Key players: India's top biotech players

- Top ten companies accounted for 39 percent of the total industry revenues in 2008-09.
- MNCs such as Novo Nordisk and Novozymes are among top 10 biotech companies.
- 19 of the top 20 companies generated revenues of over US\$ 20 million.
- Top 30 home-grown companies contributed US\$ 1.31 billion in revenues (over 57 percent of total revenues).
- Serum Institute and Biocon have crossed the US\$ 200 million mark whereas Panacea crossed the US\$ 130 million mark in revenues.
- Serum Institute is the leading biotech player with revenues of over US\$ 245 million and growth of 13 percent over last fiscal.

Top 10 companies 2008–2009		
Company	Revenue (US\$ mn) 2008–09	percent change from 2007-2008
Serum Institute of India	245.08	12.87%
Biocon	200.71	4.04%
Panacea Biotech	131.37	-11.98%
Rasi Seeds	82.63	28.07%
Nuziveedu Seeds	80.07	24.69%
Novo Nordisk	72.60	26.92%
Siro Clinpharm	61.60	—
Novozymes South Asia	55.00	11.11%
Shantha Biotech	54.34	64.67%
Jubilant	53.24	52.20%

Source: "Top 20 biotech companies," Biospectrum industry survey, June 2009, p.14,22,23; Ernst & Young analysis

Numbers may appear inconsistent because of rounding off.

Select foreign players

Novo Nordisk, India	GlaxoSmithKline, India	Novozymes South Asia
<ul style="list-style-type: none"> • Present in India since 1990 • Biopharma company • Deals in diabetes care products, human growth hormone and haemostasis management • Launched Levemir, a basal insulin analogue in May 2006. • Has an exclusive agreement with Torrent Pharma for manufacturing of insulin. • Has an agreement with TCS for offshore clinical operations service. 	<ul style="list-style-type: none"> • Present in India since 2001 • Biopharma company • Revenues: US\$ 18 million in 2008-09 • One of the top players in the Indian vaccine market • Set up vaccines facility in Nasik. • Has launched two vaccines in the preventive care category 	<ul style="list-style-type: none"> • Present in India since 2000 • Bioindustrial company • Sells more than 600 products in 130 countries • Acquired Biocon's enzyme division • Establishing R&D operations in India • Novozyme's enzymes play a significant role in food, textile, cleaning, and wastewater treatment.

Sources:

"GSK Pharmaceuticals," BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

"Novozymes intensifies enzyme proliferation," BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

Select domestic players

Serum Institute	Biocon	Panacea Biotec
<ul style="list-style-type: none"> Established in 1966 Biopharma company Signed a licensing agreement with London-based Lipoxen Technologies for a major product development program Focusing on a range of products like Hepatitis vaccines, vaccines against HIV, BCG and TB Grew by 13 percent in 2008–09, over previous fiscal Sales of US\$ 246 million in 2008–09 	<ul style="list-style-type: none"> Established in 1978 Fully integrated biotechnology enterprise, specialising in biopharmaceuticals, custom research and clinical research Wide range of products across key therapeutic segments: diabetology, cardiology, and oncology. Biocon has tied up with Bayer for their latest technology glucometer, Breeze 2, which allows a more convenient system of glucose monitoring. Biocon also recently launched Basalog, a long acting (24 hours) peak less human insulin analogue, Glargine, in India. Recorded revenues of US\$ 200 million in 2008–09 	<ul style="list-style-type: none"> Established in 1984 Biopharma company Received first supply order from WHO in 2007. The company filed 143 patent applications internationally in 2008-09, taking the tally to 828 patent applications Forayed into oncology segment to provide treatment for breast cancer, brain tumor, ovarian cancer, pancreatic cancer, prostate cancer and colorectal cancer Entered into a MoU with Punjab University, Chandigarh, for a drug discovery project. Revenue of US\$ 131 million in 2008–09

Sources:

“Serum Institute of India,” BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

“Biocon eyes R&D and brand building,” BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

“Panacea Biotec,” BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

Select domestic players

Rasi Seeds	Nuziveedu Seeds
<ul style="list-style-type: none"> • Established in 1973 • Bioagri company • Company provides seeds for various crops • Undertaken field trials and large scale trials of Bt cotton. • Has top notch marketing network all over India and two production centres. • Entered contract farming with an ELS cotton hybrid • Generated sales of US\$ 82.63 million in 2008–09 	<ul style="list-style-type: none"> • Established in 1973 • Bioagri company • Commercially released two Bt hybrid varieties • Working on indigenous transgene to combat bollworms. • Has 15 cotton hybrids in pipeline. • Generated sales of US\$ 80.07 million in 2008–09

Sources:

Rasi Seeds, BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

Nuziveedu Seeds, BioSpectrum website, <http://biospectrumindia.ciol.com>, accessed 14 September 2009

Highlights of 2009

Collaborations and acquisitions

- Sanofi's vaccine unit, Sanofi Pasteur, will acquire a subsidiary of French bioindustrial group Merieux Alliance, ShanH, which owns a majority stake in Shantha Biotechnics. The transaction, set to close before the end of the third quarter, values the Indian company at 550 million euros.

Sources:

Sanofi-Aventis to take control of Shantha Biotechnics, Dow Jones International News, 27 July 2009, via Dow Jones Factiva;
India Budget 2009, Ernst & Young 2009

Union Budget 2009-10

- The Cabinet Committee on Economic Affairs (CCEA) has approved the launch of a new scheme called Biotech Industry Partnership Programme or BIPP. As a principle, BIPP would strictly promote high risk, transformational technology/process development. No incremental development will be supported.
- Excise duty rate reduced to four percent.

Advantage India

Low-cost operations

- R&D costs in India significantly lower; outsourcing to India can save up to US\$ 200 million.
- Cost of clinical trials 50 percent lower in phase I and 60 percent lower in phase II compared to global markets.
- Clinical trials take significantly lesser time in India.

Large pool of talented human resources

- India has a large talent pool of science students pursuing higher education.
- 5000 PhDs and 1000 post-doctorals in biosciences-related fields.
- Numerous top-notch life science education and research institutes.

Advantage India

Favourable IP climate

- Adherence to the TRIPS agreement with regard to the Patent Protection Act implemented in 2005 has increased the confidence of innovator companies in India.

Some bioscience related Indian institutions

Name of institution	Area of focus
National Center for Biological Sciences	Biochemistry, bioinformatics and genetics
Jawaharlal Nehru Institute for Advanced Scientific Research	Molecular and chemical biology and genetics
National Institute of Immunology	Immunology
Institute of Genomics & Integrative Biology	Genomics, genome informatics and proteomics
International Centre for Genetic Engineering and Biotechnology	Molecular biology and biotechnology
Centre for Cellular & Molecular Biology	Bioinformatic and genetics
Centre for DNA Fingerprinting & Diagnostics	Computational biology and bioinformatics
Central Drug Research Institute	Drug discovery and regulatory studies

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