Lifesciences & Biotech Innovation in Asia

Stanford, Nov 2007

Evolution of Pharmaceuticals Industry in India

Target Validation,
Lead optimization,
Pre-clinical
& Clinical Trials

Clinical
Trials

Chemistry,
Biology
Services

Manufacturing
Generics

Manufacturing
Bulk Chemicals

Reverse Engineering
Process development

1980 '85 '90 '95 2000 '05 '10

Cost Arbitrage

+ Quality

+Technology

+Innovation

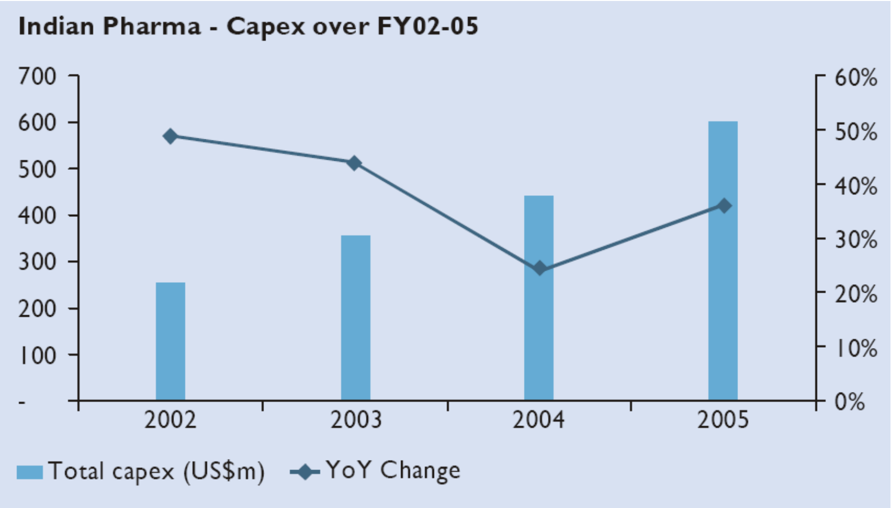
India’s Cost Competitiveness: key advantage

Pfizer
Glaxo Smith Kline
Aventis
Merck
J&J
AstraZeneca
Novartis
Roche
Bristol-Myers Squibb
Wyeth
Eli Lilly
Schering Plough
Abbott
Takeda
Boehringer
Astella

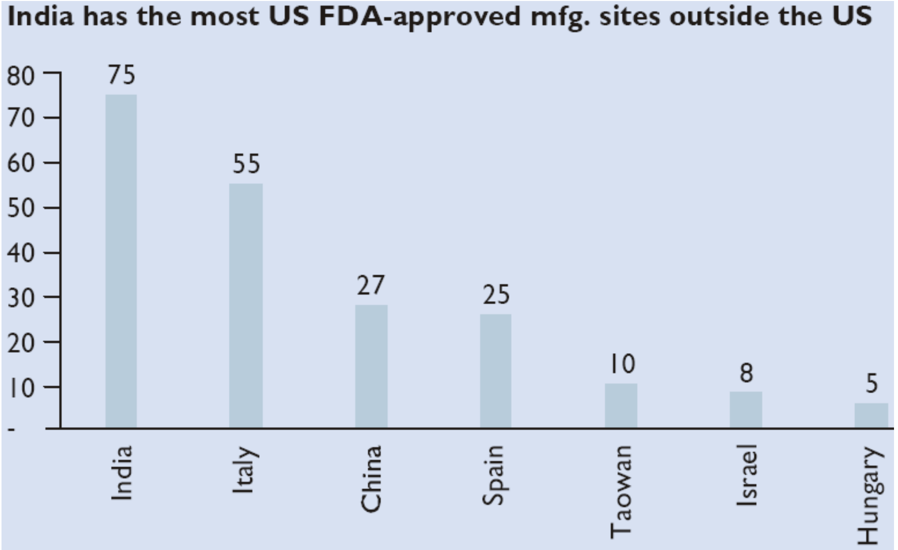
- **Western Co: 40% cost reduction by site transfer to India**
- **USFDA approved plants at 50% lower capital costs**
- **IT and hybrid ecosystems. EMR, JCAHO certified hospitals**
- **India’s huge resource of skilled scientists, available at a fraction of the cost in developed countries**
- **Costs of pre-clinical studies driving companies to India**
- **Enhanced biomed infrastructure & costs are key growth drivers**
- **Indian CROs: Complete pre-clinical solutions at one location**
- **Laboratories and facilities to international standards**
- **Compliant with int’l regulatory guidelines: OECD, EC, EU etc.**
- **CRO Services: Dossier preparation, Regulatory summaries, Product registration, Product defense**

Significant capacity expansion by Indian companies

- Significant capacity build up by the Indian industries
- Indian pharma companies have undertaken combined total capex of over US$ 1 bn between 2003 – 05
- Net fixed assets of Indian pharma companies have grown by 50% to US$ 1.6 bn during 2003 - 05
- Aggregate capital expenditure of fifteen largest generic companies tripled between 2000-04
- Second and third tier companies making heavy investment to service planned forays into regulated market
- India tops in number of USFDA approved plants outside the US
- $7 Billion market, Net exporter, CAGR 26% past 10 years



This includes - Ranbaxy, Reddy, Cipla, Sun Pharma, Wockhardt, Cadila, Jubilant, Matrix, Glenmark, Auribindo, Nicholas and Biocon



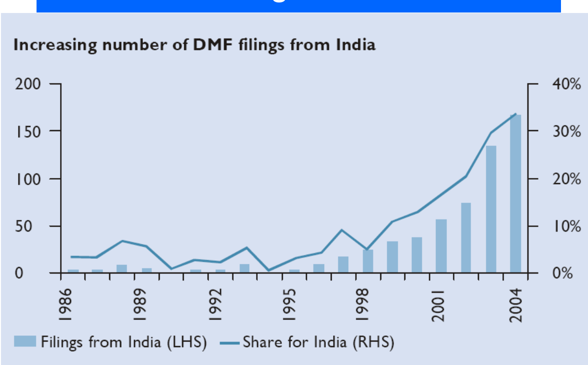
India tops in global DMF and ANDA filings

- **India: 35% of Drug Master Files & 25% of Abbreviated New Drug Applications filed globally**
- **Second and third tier Indian companies have aggressively scaled up ANDA/DMF filing in the US market over the last 2-3 years**

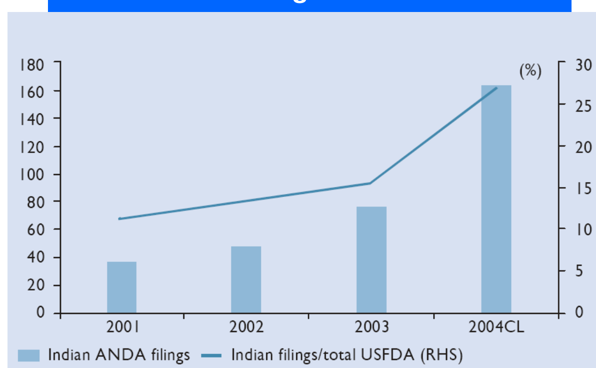
ANDA pipeline of Indian companies

Company	FY02	FY03	FY04	FY05	Pending
Ranbaxy	15	25	25	29	60
Sun Pharma	1	3	6	22	24
Dr Reddy's	6	14	13	13	45
Glenmark	-	-	-	7	5
Cadila	-	-	12	13	20
Orchid	-	-	-	18	17
Lupin	2	3	-	14	15
Aurobindo	-	-	2	22	28
Wockhardt	-	1	6	6	14
Total	**24**	**46**	**24**	**144**	**230**

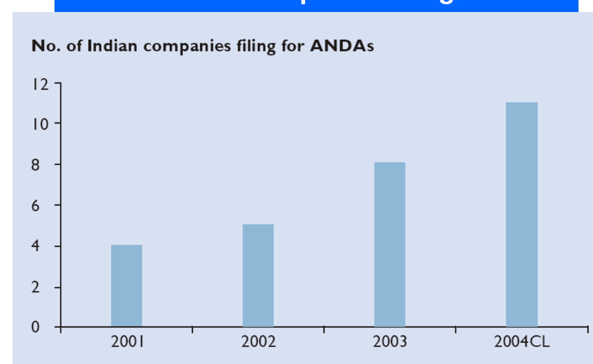
DMF filings from India



ANDA filings from India



No of Indian Companies filing ANDAs



Bio-tech in India

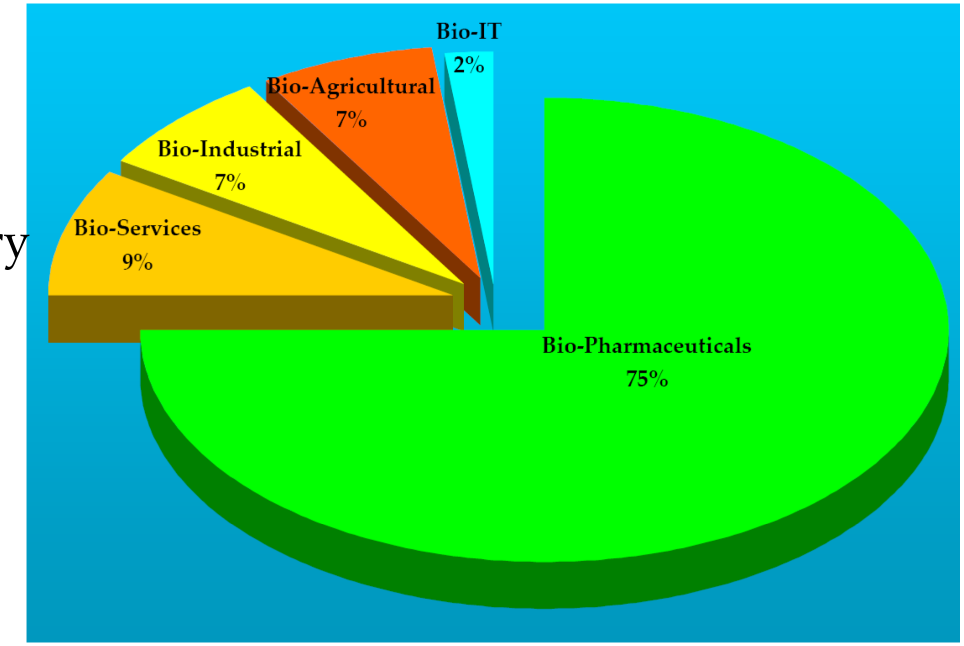
$1 Billion, grow to 5 Billion by 2010

Pharma: Stem Cells, Drug design & delivery

Vaccine hub: Veterinary, DPT, Measles

Agri: Fertilizers, Pesticides, Seeds, Fuels

Bio-IT: Gene annotation, Data mining



Bharat Serums And Vaccines Limited

SHANTHA BIOTECHNICS

Biocon

LabVantage

ALFA LAVAL

BD

MILLIPORE

SERUM INSTITUTE OF INDIA

Panacea Biotec

sartorius

Aventis

BIO-RAD

Lilly

WOCKHARDT

Nicholas

novo nordisk

MONSANTO imagine

Roche

syngenta