

26 July 2007

**BUY**Price  
Rs385Target Price  
Rs536

Sensex -15,699

**Price Performance**

(%)	1M	3M	6M	12M
Absolute	(5)	(12)	(2)	14
Rel. to Sensex	(13)	(20)	(11)	(24)

Source: Bloomberg

**Stock Details**

Sector	Biotechnology
Reuters	PNCA.BO
Bloomberg	PNCB@IN
Equity Capital (Rs mn)	66
Face Value	Rs1
52 Week H/L	Rs 494/287
Market Cap(Rs bn)	25.3
Daily Avg Volume (No of shares)	30116
Daily Avg Turnover (US\$m)	0.3

**Shareholding Pattern (%)**

Promoters	66.3
FII/NRI	21.6
Institutions	1.5
Private Corp.	5.8
Public	4.9

Source (31st Mar.'07)

Source: Capitaline

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# Panacea Biotec

Initiating  
Coverage

## Formulating growth through vaccines

Panacea Biotec is likely to continue its growth trajectory on the back of sustained growth in its oral polio vaccine (OPV) business, ramp up in combination vaccines and increased focus on formulations business. The nationwide campaign to eradicate polio has resulted in strong revenue growth for Panacea Biotec. We believe that concerns over Panacea's growth story due to stagnation in demand for OPVs are unwarranted. With a huge base of Rs 6.36bn, we expect the OPV business to grow, albeit at a slower pace. In order to reduce its dependence on the OPV business, Panacea Biotec has been concentrating on the combination vaccines and pharmaceutical formulations to drive future growth and profitability. Going forward, we expect Panacea Biotec's revenues and earnings to grow at a CAGR of 21% and 29% over FY07-09E respectively, driven by the launch of innovative combination vaccines, injectable polio vaccine (IPV) and NDDS based patented products. At CMP of Rs.385, the stock trades at 16.7x FY08E and 11.3x FY09E earnings. We initiate coverage on Panacea Biotec with a BUY rating and a target price of Rs.536, i.e. an upside of 39%.

### Oral Polio Vaccines- stable and steady growth ahead

Panacea derives 95% of its total vaccine sales from the OPV segment. We believe that the OPV segment is likely to see a steady growth of 9% CAGR during FY07-FY09E, resulting in revenues of Rs 7.56bn in FY09E from Rs 6.36bn in FY07. While the estimated growth is lower than the past growth of 62%, the slowdown is mainly on account of a higher base and additional orders for monovalent polio vaccine by Unicef in the last two years. Our belief in Panacea's OPV growth stems from a 28% increase in the government allocation for the immunization programme, WHO increasing the age bar up to 6 yrs and large birth cohort.

### Combination vaccines- good long term potential

Panacea Biotec is expecting the WHO approval for three of its combination vaccines viz. Ecovac4, Easyfour and Easyfive by Oct'07. These combination vaccines have a market potential of US\$400mn. Panacea Biotec has also formed a JV with Novartis Vaccines to tap the growing domestic combination vaccines market. We have projected revenues of \$35mn in FY09E and \$60mn in FY10E respectively from these initiatives.

### Pharma Formulations- future growth engine

The formulation segment, which accounts for just 22% of the total revenues, has been growing at a rapid pace. The formulations segment, which grew by 25% (Rs.1761mn) in FY07, outperformed the industry growth of 14%. Going forward also, we expect this segment to outperform the industry and grow at a CAGR of 27% to Rs.3650mn by FY10E. We expect the launch of organ transplant formulations in the Brazilian market, increased focus in emerging markets and filing in the regulated markets to drive Panacea's formulations growth.

### Valuation

We have valued the stock on DCF basis, assuming WACC of 11.2% and terminal growth of 4%. At CMP of Rs.385, Panacea Biotec trades at 35% discount to its peers on one year forward P/E and a 48% discount on EV/EBIDTA. Our DCF valuation suggests a target price of Rs.536, implying a 39% potential upside from current levels. Strong earnings growth of over 29% pa, 24% RoE, strong cash accruals and cheaper valuations as compared to peers warrant a Buy on Panacea Biotec

### Financials

Year	Net Sales	EBIDTA		PAT	EPS	ROE	P/E	EV/	P/BV	Div. Yld
End	(Rs mn)	Core	(%)	(Rs mn)	(Rs)	(%)	(x)	EBIDTA (X)	(x)	(%)
FY06	5419	1191	22.0	545	7.6	39.4	50.4	19.6	14.2	0.3
FY07	8424	2239	26.6	1453	20.4	32.5	18.9	12.4	3.7	0.3
FY08E	9602	2523	26.3	1647	23.1	20.2	16.7	11.0	3.1	0.3
FY09E	12381	3578	28.9	2423	34.0	24.0	11.3	7.8	2.4	0.3

## Company and business profile

Panacea Biotec is an emerging health management company with strong growth prospects, driven by proprietary technologies/products, high value pharmaceutical spaces and strategic partnerships. Panacea Biotec is the 2nd largest vaccine producer in India. The company has been ranked as the 3rd largest biotechnology company (ABLE survey 2007) and is also amongst the top 50 pharmaceutical companies in India. Panacea Biotec has 10 international product patents and has 4 state of the art R&D centers with more than 250 scientists. The company is setting up its 5th R&D center at Navi-Mumbai.

### Business Model

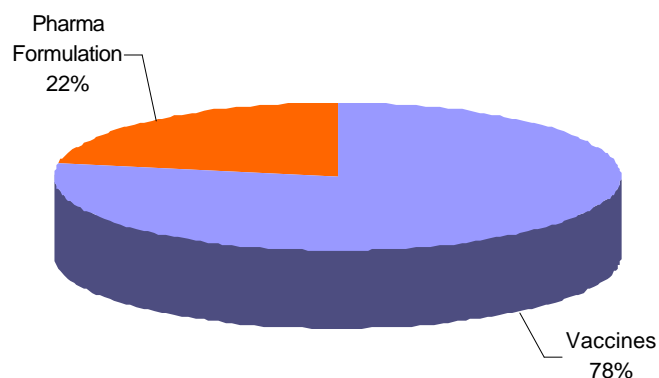
Panacea Biotec has been focusing on two main streams of health management viz. The Prophylactic (Prevention) and Therapeutic (Treatment). The vaccine portfolio represents the prophylactic part and the therapeutic part is represented by the pharmaceutical formulation.

*Vaccines account for 78% of Panacea Biotec's overall revenues*

**Vaccine segment-** Vaccines account for 78% of Panacea Biotec's overall revenues, with polio vaccines constituting a large chunk (almost 95%) and combination vaccines ; the balance. Panacea Biotec is one of the six companies globally to have WHO pre-qualification for OPV and one of the nine companies globally for Hepatitis-B. After establishing a strong foothold in the oral polio vaccines segment in India, it is now gearing for growth in the international markets through the launch of innovative combination vaccines.

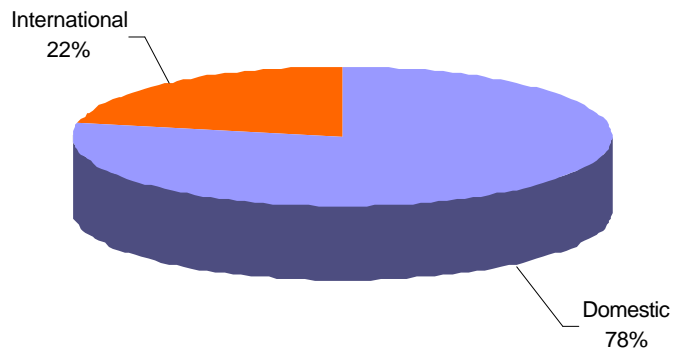
**Formulations segment-** Panacea Biotec's pharmaceutical formulations segment contributes 22% to its overall revenues. While the segment is considerably smaller than the vaccine segment, it is a high growth segment for the company and is expected to drive the future growth of Panacea. Within the wide formulation universe, Panacea is present in the therapeutic areas of pain management, diabetes management and organ transplantation. While a major share of its formulation business comes from domestic sales, Panacea is now gearing to tap the international markets with innovative NDDS-based patented products.

### Segment wise -Revenue break-up



Source: Emkay research

## Geographical Revenue -Break-up (FY07)



Source: Emkay research

*Panacea Biotec has chalked out future growth strategy*

In order to fuel its growth prospects in multiple horizons, Panacea Biotec has chalked out short term, medium term and long term goals.

## Panacea's future growth strategy

Short Term < 2 Years	Medium Term 2- 5 Years	Long Term > 5 Years
Supply of combination vaccines to WHO/ UNICEF	Launch of Thermo stable, Injectables Polio and other vaccines	Out-licensing/ Launch of Patented products in the regulated markets
Tapping growing domestic vaccine market through JV	Supply of anti-TB, ARV and combination vaccines to WHO/ UNICEF	Potential supply of Anthrax vaccine to US
Launch of proprietary and other new products in domestic market	Introduction of peptides based formulation for hair growth in global markets	
Introduction of Panimum Bioral to Latin American markets	Launch of NDDS based proprietary products in the developed markets of US and Europe	

Source: Emkay research, Company

We believe that the company is now gearing up for its first step of big growth in the international markets and is likely to derive revenues from combination and innovative vaccines as well as patented products.

## Investment Argument

*Panacea Biotec is one of the six companies in the world, who are pre-qualified by WHO for OPV*

### Oral Polio vaccines- Steady and sustainable growth ahead

Panacea Biotec's vaccine business is divided into two segments viz. oral polio vaccines (OPV) and combination vaccines. Over the years, Panacea Biotec has established a dominant position in OPV and now, this business accounts for 95% of the company's total vaccines sales.

Panacea Biotec is one of the six companies in the world, who are pre-qualified by WHO for OPV. Panacea Biotec is the largest supplier of OPV to UNICEF. It has been supplying OPV to UNICEF since FY00. Its OPV business has grown at a rapid pace from Rs. 650mn in FY00 to over Rs. 6360mn in FY07. With the government and WHO assigning top priority to polio eradication, Panacea has witnessed strong growth traction in its OPV sales.

### OPV- Is it the end of the growth story?

#### We believe- No

*Slowdown in OPV sales is likely to raise concerns on the future growth prospect of Panacea Biotec*

After the strong run up in OPV sales in the last few years, there are concerns that the OPV growth story is coming to an end. Since the OPV business is the major growth driver of Panacea, any slowdown in OPV sales is likely to raise concerns on the future growth prospects of Panacea. We believe that while the past growth is unlikely to repeat itself in the near future on account of the high base effect, the growth in absolute numbers is still quite encouraging. Going forward, we believe that the OPV business will see a more stable and sustained growth.

Our belief on the growth sustainability of the OPV business over the next 4-5 years is based on the following positive indicators:

- a) Government commitment toward polio eradication programme- The GOI has increased its allocation towards the polio immunization programme by over 28% y-o-y to Rs. 12.9bn for FY08
- b) Raising the bar for polio immunisation- WHO has increased the coverage age for polio immunisation from the current 5 years to up to 6 years, thereby increasing the base for OPVs.
- c) Higher incidence of polio cases in CY2006- The number of polio cases reported in CY2006 increased 10 fold to 676. Even during CY2007, 60 cases have already been reported till date (5th June 2007). Higher incidence of polio cases calls for increased coverage of the polio immunization drive, necessitating higher demand for OPV doses.
- d) Large birth cohort - According to Large Birth Cohort, about 25mn babies are born in India every year and even if we assume 50% reach, India needs 12.5mn additional doses every year. Thus, even on conservative estimates, OPV growth works out to 10%
- e) Strong demand for monovalent polio vaccine- Increase in demand for monovalent polio vaccine by Unicef for other markets
- f) Long way to go to achieve polio free status- As per WHO guidelines, a country will be eligible for being certified polio free only if it does not register any case of polio during three consecutive years following the year in which zero case is registered first time. India is yet to reduce polio cases to zero level for the first time.

*OPV business will see more stable and sustained growth*

On account of the above reasons, we believe that Panacea's OPV business is likely to see steady and stable growth over the next few years, putting to rest any speculation about no growth in OPVs.

*Addition of monovalent OPV and intensified polio immunization drive resulted in astounding 62% growth in FY07*

### **FY07 OPV growth- an aberration**

Panacea Biotec's OPV sales grew by an astounding 62% in FY07. This growth was mainly triggered by an additional order of Rs.1350mn of monovalent polio vaccine by Unicef for international markets. The monovalent OPV was added in polio immunisation in late FY06 and the real impact has come in FY07. As a result, Panacea Biotec saw increased orders for the monovalent polio vaccine from Unicef. Going forward too, there will be orders for the monovalent polio vaccine. However, these orders are generally repetitive in nature, thereby not resulting in incremental growth. FY07 saw a huge jump in revenues as the same was reflected in the last quarter of FY06 sales. Moreover, the polio immunisation drive was further intensified in FY07 on account of a 10 fold jump in polio cases in CY2006. Hence, we believe that the future revenue growth of 9% CAGR over FY07-09E pales in comparison to the 62% growth achieved in FY07. The additional growth triggers mentioned above are unlikely to recur in the immediate future, resulting in a smaller but more stable growth rate.

*There is a growing shift from OPVs to IPVs*

### **OPV today; IPV tomorrow**

There is a growing shift from OPVs towards injectible polio vaccines (IPVs). Identifying this trend, Panacea Biotec has entered into an agreement with the Nederlands Vaccin Instituut (NVI), Netherlands for manufacturing and marketing of Injectible Polio vaccines (IPV) in global markets except Netherlands, Denmark, Norway and Finland.

Panacea is expected to launch this vaccine in FY2008 in the Indian market. At present, 10% of polio vaccines market (total domestic polio vaccines market - Rs 7bn) is in the hands of private practitioners.

The estimated global demand for IPV is around 150mn doses and is likely to increase to around 800mn doses by 2011. In the international market, IPV would be launched by mid-2008 and even if we assume \$5 a dose (Internationally, each dose costs \$10), it translates in to a market size of \$750mn. We are expecting sales of Rs.500mn in FY09E and Rs.875mn in FY10E respectively.

*Panacea Biotec is expecting WHO approval by Oct'07 for three of its combination vaccines*

### **Combination Vaccines- A Big Opportunity**

Panacea Biotec is the first Indian company who has developed innovative combination vaccines viz. Ecovac4 (DTP+Hep.B), Easyfour (DTP+Hib) and Easyfive (fully liquid Pentavalent- DTP+Hep.B+Hib). Panacea's Easyfive is the first fully liquid pentavalent vaccine in the world. The Easyfive vaccine is available in a single vial as against the two vial vaccine offered by competitors. Panacea Biotec enjoys strong credibility with UN agencies.

Panacea Biotec has already received WHO pre-qualification for the supply of Hepatitis B vaccine to UN agencies, having a market size of US\$250mn. It is also expecting WHO approval by Oct'07 for three of its combination vaccines viz. Ecovac4, Easyfour and Easyfive, which has a market potential of US\$400mn. Globally, the pentavalent vaccine (5 in 1) accounts for 70-80% of the total combination vaccine market. At present there are only two companies pre-qualified by WHO viz. GSK and Berna Biotec and Panacea Biotec would be the third player to cater to this large global opportunity. Even if we conservatively estimate a 10% market share of the combination vaccines market in the first year (FY2009), it turns out to be a \$40mn opportunity for Panacea Biotec. However, in our estimates we have projected revenues of \$20mn in FY09E and \$40mn in FY10E respectively from the combination vaccines.

*JV has captured 35% of market share in two years of launch*

### JV with Novartis vaccines to tap growing domestic vaccines market

In order to tap growing private pediatric domestic vaccines market in India, Panacea Biotec has formed a 50:50 JV with Novartis vaccines (formerly Chiron Corporation, UK), the world's fifth largest vaccine company. At present, the JV is marketing 4 vaccines and has garnered 35% share (Rs.600mn in FY07) of the pediatric combination vaccine market within two years of its launch. This segment, though currently small, is expected to grow at a strong pace going forward. The current domestic market size for these combination vaccines is close to Rs.1.25bn and is growing at 25-30% per annum. We expect the JV to contribute Rs.900mn in FY08E and Rs.1200mn in FY09E respectively.

*Host of collaborations and tie-ups for future growth*

### Strategic collaborations for new innovative vaccines to drive future growth

Panacea Biotec has entered into a host of collaborations and tie-ups with various global institutions to enhance its product portfolio and reduce its dependence on OPV in the long term. These collaborations are of long term nature and are likely to be the future growth drivers for Panacea. Some of the initiatives like **Thermostable vaccines** (eliminate the need to maintain cold chain storage); initiation of phase IIb trials for **Recombinant Anthrax vaccine** (market potential of over \$850mn in US), **Japanese Encephalitis vaccine** (market potential- \$300mn), **Peptides based formulations** for hair growth and Research collaboration with an **European MNC** offers huge potential going forward. We have not factored any upside from these initiatives or tie-ups in our estimates. Some of these alliances are enumerated as follows:

*Thermostable vaccines eliminate the need for cold chain*

### JV with Cambridge Biostability of UK

Panacea Biotec has entered into a JV agreement with Cambridge Biostability Ltd. (CBL) of the UK, a pioneering developer of temperature stable liquid vaccines. Under this agreement, Panacea Biotec will in-license CBL's stable liquid technology to develop, produce and market a stable liquid version of Pentavalent and other combination vaccines. It must be noted that vaccines are as such required to be stored under refrigeration and this technology will eliminate the need for cold chain, which currently costs around \$200mn a year. As per the management, the key customers for these thermostable vaccines are the UNICEF, the PAHO (Pan American Health Organization) and other international organizations. With the Unicef alone purchasing between \$370-400mn of these vaccines annually, a pentavalent thermostable vaccine from the company has a market potential of over \$135mn.

Panacea Biotec has also acquired a 10% stake in CBL for a total consideration of \$3.81mn, under a JV agreement. CBL also signed a long-term licensing agreement with Panacea Biotec that could provide significant gross royalty income to CBL over the period.

Panacea Biotec is expecting to launch this product globally in 2010 and thus we have not factored the same in our projections. However, this has a huge potential in the long term.

*RAV- a big opportunity for Panacea Biotec in the long term*

### Recombinant Anthrax Vaccine

Post anthrax threat in 2002, the US government launched a \$5.6bn project, "Bio shield" in an effort to counter the bioterrorism threat. Potential supply of Recombinant Anthrax Vaccine (RAV) to US government under the above project can present US\$850mn opportunity for Panacea Biotec in the long term (not factored in our estimates). Panacea Biotec has already completed Phase I/IIa clinical trials and Phase IIb is expected to be over by Dec.'2007. We expect Panacea Biotec to file its dossier with USFDA in FY08. Given the urgent need for a new and relevant vaccine for anthrax, we expect a speedy approval for Panacea's RAV. The following exhibit reflects the current situation on the anthrax vaccine front.

- The US govt. cancelled its \$877.5mn contract with VaxGen Inc. (to whom the contract was awarded in 2004) for a new anthrax vaccine, after problems with the vaccine's stability caused the company to miss a deadline for starting clinical trials.
- Emergent BioSolutions Inc. announced that the U.S. Department of Health and Human Services (HHS) and the U.S. Department of Defense (DoD) issued two separate notices of intent to procure up to a combined total of 22.75 million doses of BioThrax(R) (Anthrax Vaccine Adsorbed). (Biothrax is the only licensed vaccine from FDA , developed in 1950's having few side effects)
- Department of Health and Human Services (HHS) recently issued a notice that it needed 25 million doses of an anthrax rPA vaccine with an option to buy 40 million more doses. The notice also said respondents must have an FDA investigational new drug application that is not on clinical hold, which VaxGen said appears to exclude the company from responding to the HHS request.

All these latest developments increase the probability of Panacea Biotec's potential supply of anthrax vaccine to US government starting earlier than our estimated time line. We believe any positive development in this front could result in revenue potential of up to US\$250mn to Panacea Biotec in FY09 (not factored in our estimates).

### Measles vaccine

*Measles vaccine is in short supply and critical*

Panacea Biotec has tied-up with PT Bio Farma of Indonesia to manufacture and market measles vaccine. As per the agreement, Panacea Biotec will manufacture and supply the vaccine, developed from the bulk vaccine produced by PT Bio Farma. This vaccine is expected to be launched by mid-2008.

In 2001, WHO along with other organisations like Unicef and Red Cross, etc launched the measles initiative program for eradicating the disease from Africa. The programme has successfully controlled measles cases and death, reducing the number by 60%. From WHO regulatory body point of view, measles vaccine is in short supply and critical.

Globally, the measles vaccine market is worth around \$25-30mn. In India alone, demand for measles vaccine is estimated at 40mn doses annually. PT Bio is one of the four measles vaccine manufacturers pre-qualified by WHO for supply to UN agencies. We believe that Panacea Biotec would be able to register Rs.100mn and Rs.150mn in FY09E and FY10E respectively.

### Other critical collaborations and tie-ups

National Institute of Health, USA	In-licensing technology for development of hormone based formulation for hair growth- Peptides
National Institute of Immunology, India	10 years exclusive in-licensing agreement for Japanese Encephalitis vaccine starting May 2004
National Research development Corporation, India	Panacea Biotec to manufacture and market Foot & Mouth Disease (FMD) vaccine developed by Indian Veterinary Research Institute in India and International markets

## Critical Vaccines under development

Product	Manufacturing & Analytical validation	Development stages Mfg. & Analytical Standardizations	Pre-Clinical	Clinical Trials	Approx. Market Size
Hib Vaccine	Completed	Completed	Completed	Completed	\$225*mn
Recombinant Anthrax Vaccine	Completed	Completed	Completed	Phase I/IIa completed, Phase IIb initiated shortly	\$1bn
Inactivated Polio Vaccine	Completed	Completed	Completed	To be initiated shortly	\$750mn
Hepatitis-A	Completed	Completed	To be initiated shortly		
Menigococcal Vaccine	Completed	Completed	To be initiated shortly		
Pneumococcal Japanese Encephalitis	Completed	Completed	To be initiated		\$300mn*
Hexavalent Dengue Vaccine	In progress	In progress			\$300-400mn
	Completed	Completed	Completed	Completed	\$300-400mn

Source: Emkay research, Company

## Pharmaceutical Formulations- on a high growth trajectory

## Strong growth in the domestic market

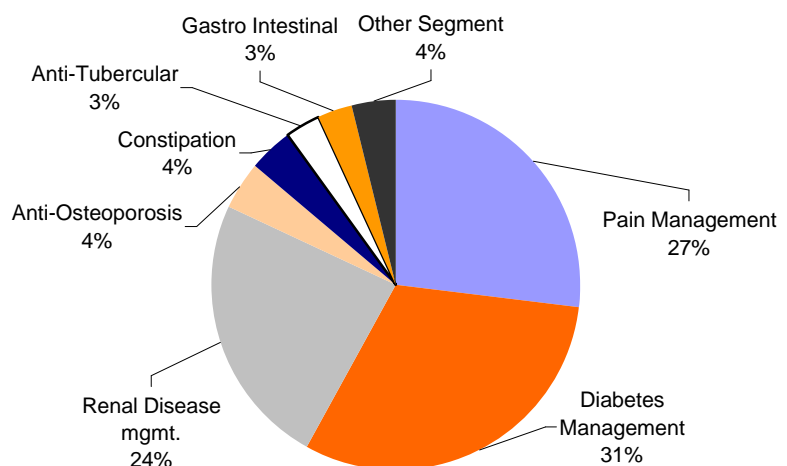
*Panacea Biotec has strong brand franchises in niche segments*

The formulation segment accounts for 21% of the Panacea Biotec's total revenues, out of which domestic business contributes 85% of total formulation sales. Over the years, Panacea Biotec has established strong brand equity in therapeutic segments like Pain Management, Diabetes and Organ Transplantation. 7 key brands (Glizid, Glizid-M, Nimulid, Willgo, Panimum Bioral, PanGraft and Mycept) in these segments constitute over 80% of its domestic formulations and two of its key brands Glizid-M and Nimulid are among the top 2 brands in their respective categories.

Panacea Biotec's Brands	Market Share	Ranking
<b>Pain Management</b>		
Willgo	49%	1
Nimulid MD	32%	1
<b>Diabetes Management</b>		
Glizid M	24%	1
Glizid (80 mg)	22%	1
Glizid (40 mg)	28%	2
<b>Renal / Organ Transplantation</b>		
Panimum Bioral	98%	1
Mycept	62%	1
PanGraft	39%	1

\* Source: (ORG IMS MAT March-07)

## Therapeutic Segment break-up



Source: Emkay research



*We expect domestic business to grow at a CAGR of 16% over FY07-10E*

The domestic formulation business has shown a growth of 21% in FY07 and going forward, we expect this business to grow at a CAGR of 16% over FY07-F10E on account of

- a) Introduction of NDDS based innovative products
- b) Focus in niche therapeutic areas with specialty focus approach
- c) Plans to enter the oncology segment in the domestic market (estimated to be Rs.800 crore and growing at 22%)
- d) Healthy industry growth in domestic formulation business

#### **Formulation exports: The next growth driver**

*Panacea Biotec has devised a two fold strategy to ramp up its exports over the next few years*

Panacea's formulation exports constitute a small 15% of their total formulations business. However, Panacea has been devising a two fold strategy to ramp up its exports over the next few years. Panacea is focusing on the emerging markets to improve its geographical reach and ramp up volumes. It is also targeting the highly regulated high margin markets of EU and US. Thus, Panacea's two pronged strategy to improve volumes as well as margins are likely to ensure strong export growth in the future. We expect Panacea's exports to grow by a CAGR of 71% over FY07-10E.

#### **Emerging Markets - Big Opportunity for growth**

*We expect export business to grow at a CAGR of 71%*

On the export front, the company has been focusing on the emerging markets in the African Region, CIS, Middle East and the Asian markets. The export turnover registered a growth of 55% in FY07 to Rs.257mn (Rs.166mn in FY06). In order to further strengthen its presence in other semi-regulated markets, Panacea Biotec is entering into markets like Mexico, Turkey and Israel.

Moreover, Panacea Biotec is also in the process of launching its branded formulations in the organ transplantation segment viz. Panimum Bioral (Cyclosporin), Pangraf (Tacrolimus) and Mycept (Mycophenolate Mofetil) in the Brazilian market. We expect these brands to generate revenues of \$5mn in FY08E and \$10mn in FY09E.

We believe all these initiatives would lead to a buoyant growth in international formulation business and expect this business to grow at a CAGR of 71% in the next 3 years to Rs.1280mn in FY10E (Rs.257mn in FY07).

#### **Regulated Markets- Key focus area for long-term growth**

*The company is now gearing up to enter the big league by launching patented products in regulated markets*

Panacea Biotec has a rich pipeline of 10 NDDS based patented products with a market potential of \$10bn. The company is now gearing up to enter the big league by launching these products in the regulated markets of Europe and US. Panacea Biotec has already initiated the registration process and these products are in the niche area of pain management, organ transplantation and piles management, etc. The company is in the process of initiating phase III clinical trials for two key products, Willgo and Sitcom for the German market and plans to file the registration dossiers in Germany by mid 2008. These two key products Willgo and Sitcom have market potential of \$3-5bn and \$500mn respectively in the EU and US. In Germany, the company expects to launch these products by 2nd half of FY08.

Though these products offer huge revenue potential in FY09E and FY10E, owing to uncertainty of time factor, we have not factored any upside from these products in our estimates.

## Patented Products for International Launches

Brands	Molecule	Target market	Exp. Launch	Market size
Willgo	Nimesulide controlled release	Europe and US	2008-09	\$5bn
Sitcom	Euphorbia prostrata extract for Haemorrhoids management	Europe and US	2008-09	\$500mn
Panimum Bioral	Cyclosporine	Europe and US	2008-09	\$1bn
ODPEP	Domperidone + Pantaprazole	Europe and US	2008-09	\$500mn
2 Good	Amoxycillin modified release	Europe and US	2008-09	\$500mn
Nimulid Transdermal Gel	Nimesulide transgel	Europe and US	2008-09	\$150mn

\* Basic molecules are out of patent, Panacea Biotec has NDDS patent

\* Proposed launch- Europe (UK, France, Italy, Germany)-2008

\* Proposed launch- US- 2009

## R &amp; D- Building pipeline for future

*Panacea Biotec spends 6% of its revenues in R&D*

Panacea Biotec has a pentagon of R&D centers i.e. five R&D centers with each focusing on independent research areas. The company's core areas of research include:

- Novel Drug Delivery Systems- Pharmaceutical Formulations
- De-novo Vaccines Development
- Biopharmaceuticals
- New Drug Discovery- Small molecules
- Advanced Drug Delivery Systems- Pharmaceuticals and Biologicals

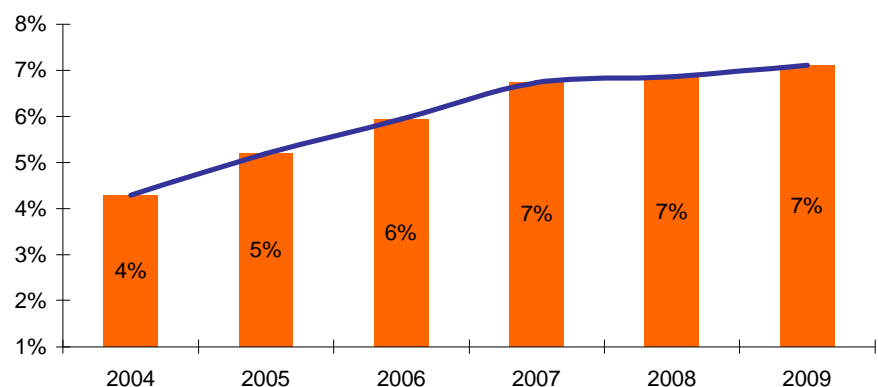
The company's R&D centers are well equipped and are capable of complete research and development activities from pre-clinical to clinical development.

*Panacea Biotec's fifth R&D centre 'GRAND' focusing on Advanced Drug Delivery Systems*

Panacea Biotec's fifth R&D centre 'GRAND' focusing on Advanced Drug Delivery Systems, is under construction in Navi Mumbai and is expected to be operational during the current fiscal. At this centre, the company plans to develop new and advanced NDDS based products.

The company has gradually stepped up its R&D expenditure, which is 6% of the revenues in FY07 and we expect it to increase to 7% in FY08E.

## R &amp; D expenditure as % of Sales



Source: Emkay research

*Effective tax rate has come down from 39% in FY06 to 30% in FY07*

### **Building manufacturing muscle for the future**

Panacea Biotec has put up a state of the art pharmaceutical formulation plant in the tax free zone of Baddi in Himachal Pradesh, in compliance with the regulatory standards of the US-FDA, UK-MHRA, SA-MCC, WHO-cGMP, etc., in order to tap the growing demand from its international business. It has also set up soft gelatin capsules facility in Baddi with an annual capacity of 150mn capsules. This facility will enable the company to supply the Panimum Bioral and soft gel products in domestic and international markets.

These initiatives will result in 100% savings of excise duty and sales tax for 10 years and income tax rebate (100% for first five years and thereafter 30% for next five years).

Within the first year of its operation, the effective tax rate of the company has come down from 39% in FY06 to 30% in FY07 and going forward, we expect tax rates to further come down to 26% in FY09, once vaccine formulation facility at Baddi will be operational.

The company has planned a capex of Rs.200 crore in the next 2 years for new projects (vaccine facility at Baddi as well as Lalru in Punjab and R&D centre in Navi Mumbai).

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**SWOT Analysis of Panacea Biotec**

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**Strengths**

- 2nd largest vaccine producer
- Pre-approval of WHO for OPV and Hep.B
- Proprietary based 10 international patented products
- Strategic Tie-ups and collaborations
- Strong focus in niche segment of pharmaceutical formulation business
- 4 R&D centers with over 250 scientists

**Weakness**

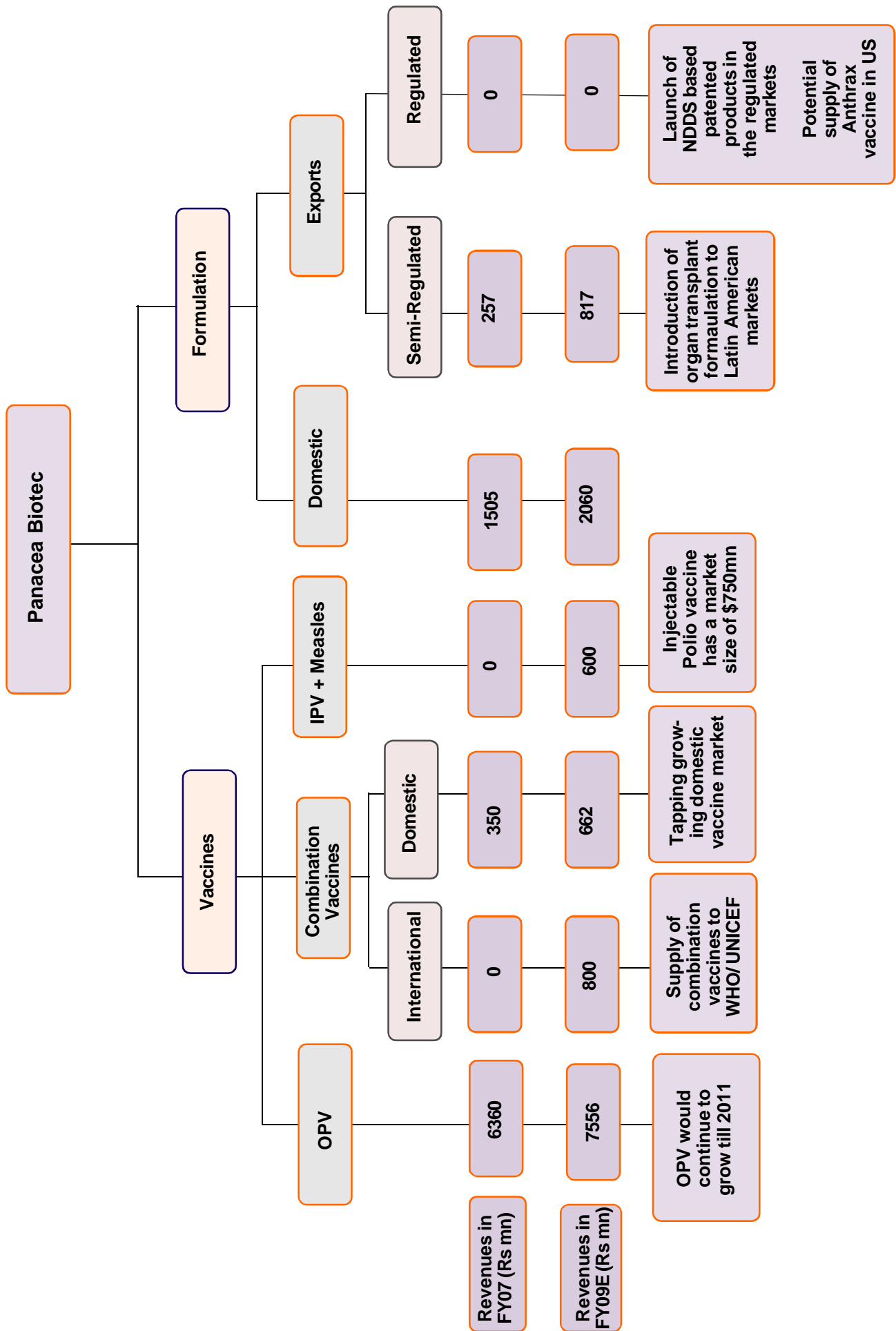
- High dependency on OPV
- Low penetration in International markets
- Lack of presence in the regulated markets

**Panacea Biotec****Opportunities**

- Launch of combination vaccines in international markets
- Launch of IPV in domestic and international markets
- Launch of patented products in the developed markets of US and Europe
- Launch of Thermostable vaccine and other vaccines
- Potential supply of Anthrax vaccine to US

**Threats**

- Execution risk in innovative combination vaccines and NDDS based proprietary products
- Separation risk for collaboration and Tie-ups
- Potential delays in regulatory approvals
- Panacea Biotec's 85% of pharma formulation revenues comes from domestic sales. As a consequence, the company would be vulnerable to any adverse amendments to the drug policy



## Financial Performance

### Strong Revenue growth over the past 3 years

*Revenues & PAT have grown at a CAGR of 47% and 109% over FY04-07 respectively*

Panacea Biotec has shown phenomenal growth over last 3 years, with revenues and PAT growing at a CAGR of 47% and 109% to Rs.8.42bn and Rs.1477mn over FY04-07 respectively. The strong growth was a result of increasing institutional demand for OPVs from UNICEF.

Over the last three years, company's margins have improved substantially. The EBIDTA margins have improved from 18.3% in FY05 to 26.6% in FY07 and NPM from 7.2% in FY05 to 17.2% in FY07.

### Earnings stability and consistency

*Panacea Biotec has shown consistent performance in the past 4 years*

Panacea Biotec has performed consistently in the past 4 years. Its revenues expanded at a 47% CAGR during FY04-07, which was the highest amongst its peers.

Rs (mn) - Standalone	FY04	FY07	CAGR
Panacea Biotec	2616	8316	47%
Biocon	5019	8510	19%
Lupin	11193	19709	21%
Cadila Health	9265	14137	15%
Ranbaxy*	36376	41172	6%
Cipla	18422	35721	39%

\*December ending \*Source: Capitaline

We expect Panacea Biotec to deliver predictable earnings growth over the next 2 years, primarily due to the steady business of OPV, launch of combination vaccines; IPV and innovative NDDS based patented products in the international markets.

### Q1FY08 : Flat results but we remain positive on future growth prospects

*Rupee appreciation has affected Q1FY08 growth*

Panacea Biotec reported flat Q1FY08 numbers. Net sales for the quarter remained flat at Rs.2334.3mn as against Rs.2333.9mn in Q1FY07. The formulation segment grew by 27% to Rs.497.5 mn in Q1FY08 and domestic JV for vaccine sales reported 54% growth over corresponding period. However, the strong rupee impacted the OPV business, which contributes 78% of total sales. In dollar terms, the OPV business registered a growth of 4% but since rupee has appreciated by more than 10%, it resulted in the OPV business reporting a de growth of 5% to Rs.1837mn in Q1FY08 (Rs.1940mn in Q1FY07). EBIDTA margins were down by 620bps on Y-o-Y basis to 30.1% in Q1FY08, though on Q-o-Q basis it was up by 1140bps. EBITDA margins in the vaccine segment were down because of the strong rupee, where margins came down by 420bps to 43.2% in Q1FY08 compared to 47.4% in Q1FY07. However, EBITDA margins in formulation were more or less stable at 16.3% in Q1FY08. Depreciation cost during the same period increased by 32% to Rs.918mn due to new facilities, which started operation during last year. Net profit for the quarter was down by 5% to Rs.472.5mn (Rs.497.6 in Q1FY07). Diluted EPS for the quarter was Rs.6.63, down by 3.5%. The company has not covered itself in the past against currency fluctuations. However going forward, the company has decided to hedge itself against currency fluctuation to cover itself from the forex risk.

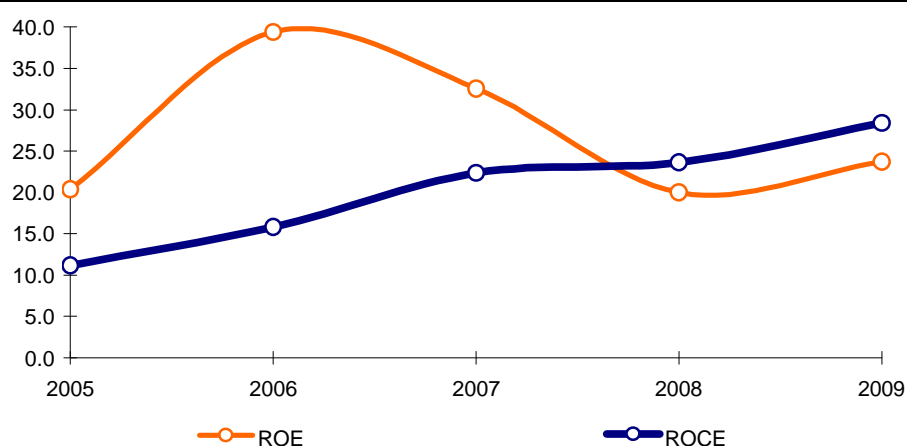
### Stable ROE and ROCE

*Panacea Biotec has maintained RoE above 20% during the past 3 years*

Panacea Biotec has been able to maintain its ROE above 20% during the past 3 years. Since the company has already converted its \$55mn FCCB in FY07 (\$50mn @ conversion price of Rs.276.3 and \$5mn @ Rs.357 per share) and the stock price is ahead of the conversion price, we have assumed remaining \$45mn FCCB conversion also from FY07 onwards.

This has resulted in the company's net worth to rise significantly resulting in lower ROE in FY08.

ROE and ROCE



Source: Emkay research

Capex and cash flow

Planned a capex of Rs.2000mn over FY07-09E

Over the past 4 years, Panacea Biotec incurred substantial capital expenditure (approx. Rs.3.28bn) to set up various facilities for its different business segments and for its R&D requirement. In FY06, the company raised about Rs. 4462mn via FCCB to fund its capex programme. We have assumed the entire FCCB of \$100mn conversion in FY07 estimates leading to equity dilution of about 14.31mn shares. The consequent increase in share capital as a result of conversions would be about 14.31mn (face value Rs. 1 per share) and the share premium would accordingly be increased by Rs.4448.18mn. Consequently the debt equity, which was 1.5x in FY04, is likely to be reduced to almost nil.

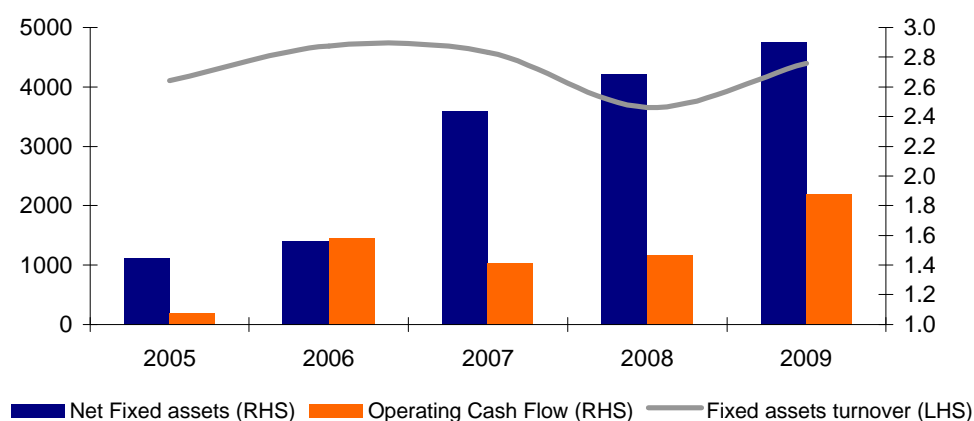
We expect Panacea Biotec to report positive operating cash flow of Rs.1186mn in FY08E and Rs.2928mn in FY09E. Majority of these cash flows would be utilized for funding their capex programme of Rs. 2000mn over FY07-09E.

Investing in growth

Fixed Assets turnover in excess of 2.5x over FY05-07

Panacea Biotec has been utilising its operating cash flows to make investments in manufacturing capacity. In spite of the addition to fixed assets, the company has been able to keep the fixed assets turnover in excess of 2.5x over FY05-FY07.

Operating Trends



Source: Emkay research

### Growth momentum to continue

*We expect Panacea Biotec's revenues to grow at a CAGR of 21% over FY07-09E*

We expect Panacea Biotec's revenues to grow at a CAGR of 21% over FY07-09E. The revenue growth will be driven by

- Launch of combination vaccines in international market and to further strengthen the growing domestic vaccines market through JV
- Steady growth of OPV business at a CAGR of 9% over FY07-09E
- Introduction of branded formulations i.e. Panimum Bioral, Pangraf and Mycept in the organ transplantation segment in the Brazilian market and other products in semi-regulated markets
- Launch of IPV in domestic as well as international markets
- Launch of new products and entry into oncology segment to strengthen domestic formulation business
- Submission of dossiers in the regulated markets for patented products

*Steady improvement in revenue mix would drive a 230bps expansion in EBIDTA over FY07-09E*

Panacea Biotec's EBIDTA margin (26.6%) in FY07 is higher on account of higher contribution of vaccine business. Steady improvement in revenue mix, along with scale effect, would drive a 230 bps expansion in EBIDTA over FY07-09E (28.9% in FY09E).

*Formulation business is likely to go up to 24% by FY10E*

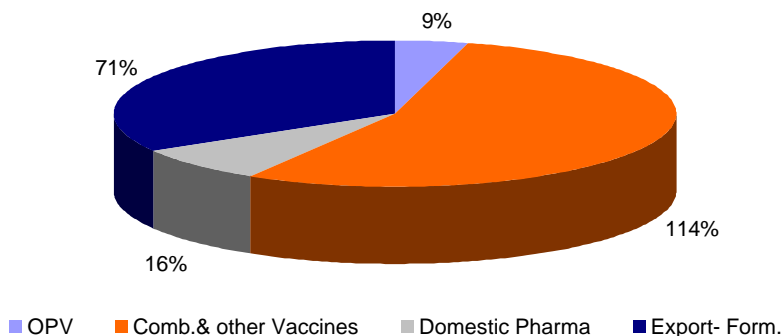
We believe by FY10E, the contribution of vaccines business will come down to 76% from 78% in FY07 (CAGR growth of 20%), while the formulation business which currently accounts for 22% of net sales is likely to go up to 24% by FY10E to Rs.3650mn on the back of launch of NDDS based patented products in the international markets.

### Segment wise contribution (Rs. Mn)

Segments	FY07 Cont. -Sales (%)	Ebidta Margins (%)	FY07	FY08E	FY09E	FY10E	FY07-10E CAGR	FY10 Cont.- Sales (%)
<u>Vaccines</u>								
OPV	76		6500	7150	7865	8494	9%	57
<i>Growth</i>			64%	10%	10%	8%		
Comb. Vaccine	2		211	317	1743	2824	137%	19
<i>Growth</i>			55%	30%	451%	62%		
<b>Vaccines-Total</b>	<b>78</b>	<b>42.7</b>	<b>6711</b>	<b>7467</b>	<b>9608</b>	<b>11318</b>	<b>19%</b>	<b>76</b>
<b><i>Growth</i></b>			<b>62%</b>	<b>11%</b>	<b>29%</b>	<b>18%</b>		
<u>Pharma</u>								
Domestic	19		1505	1806	2112	2429	17%	16
<i>Growth</i>			21%	20%	17%	15%		
Export	3		257	534	817	1220	68%	8
<i>Growth</i>			55%	30%	25%	20%		
<b>Pharma- Total</b>	<b>22</b>	<b>17</b>	<b>1761</b>	<b>2339</b>	<b>2929</b>	<b>3650</b>	<b>27%</b>	<b>24</b>
<b><i>Growth</i></b>			<b>25%</b>	<b>33%</b>	<b>25%</b>	<b>25%</b>		
<b>Total</b>	<b>100</b>	<b>26.6</b>	<b>8472</b>	<b>9806</b>	<b>12538</b>	<b>14968</b>	<b>21%</b>	<b>100</b>



Sales growth contributor (FY07-10E CAGR)



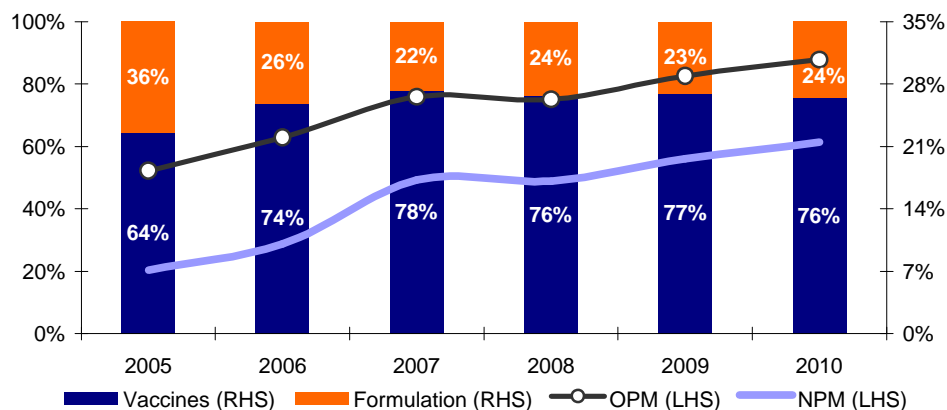
Source: Emkay research

We expect PAT to grow a CAGR of 29% over FY07-09E

29% CAGR in earnings estimated over FY07-09E

We expect Panacea Biotec to deliver a CAGR of 29% in PAT over FY07-09E on account of

- Steady growth in all the businesses and impact of organ transplantation formulations export to Brazil
- Operating margins expansion by 230 bps to 28.9% in FY09
- Tax and excise duty saving because of commencement of vaccine manufacturing facility at tax free zone of Baddi, Himachal Pradesh
- Substantial saving in interest cost, because as of today, it is almost a debt-free company.



Source: Emkay research

## Outlook and Valuation

*We expect EPS to grow a CAGR of 29% over FY07-09E*

We expect Panacea Biotec sales to grow at a CAGR of 21% and PAT to grow at a CAGR of 29% over FY07-09E. In FY07, company has reported other income of Rs.305mn on account of interest income and forex gain. Going forward, we expect other income to come down from Rs.305mn to Rs.150mn, thus affecting the net profit of the company. Panacea Biotec has posted a diluted EPS of Rs.20.35 in FY07 and we expect EPS to grow by a CAGR of 29% to Rs.23.1 and Rs.34 in FY08E and FY09E respectively.

We believe from FY10E onwards, Panacea Biotec will show significant growth due to the launch of NDDS based patented products in the regulated US and European markets, full impact of launch of combination vaccines as well as IPV vaccines in the international markets. We have not considered any revenues from Thermostable vaccines, potential upside from Anthrax vaccine in US and revenues from proprietary products in the regulated markets. Realisation from these initiatives will further add to our estimates.

### DCF Valuation

*Panacea Biotec trades at 35% discount to its peers on one year forward P/E and a 48% discount on EV/EBIDTA*

Our target price is derived using a 3 -stage DCF methodology. At CMP of Rs.385, Panacea Biotec trades at 35% discount to its peers on one year forward P/E and a 48% discount on EV/EBIDTA.

Our DCF valuation suggests a target price of Rs.536, implying 39% potential upside from current levels.

We have assumed varyin growth rates during the first stage (uptill 2011), followed by a middle period of 8% growth and a terminal growth rate of 4%. We have assumed WACC of 11.2%.

With strong visibility of an earning growth of 29%+ pa over the next three years, 24% RoE, strong cash accruals and no fears of dilution, we believe that Panacea Biotec is an excellent investment opportunity.

### DCF valuation generates potential 39% upside

Period	0	1	2	3	
Y/E Dec (Rs mn)	FY07	CY08E	CY09E	CY10E	CY11E
PAT	1452.8	1647.0	2423.4	3244.8	3128.7
Depreciation	272.7	368.1	460.2	598.2	601.0
Interest(1-T)	152.2	18.1	24.0	26.0	30.7
Capex	(1495.7)	(1000.0)	(1000.0)	(500.0)	(500.0)
Inc in Working Capital	(859.5)	(821.2)	(650.1)	(648.1)	(700.0)
Investments	(168.1)	0.0	0.0	0.0	
<b>FCFF</b>	<b>(477.5)</b>	<b>211.9</b>	<b>1257.5</b>	<b>2721.0</b>	<b>2560.4</b>
Discount Rate	1.0	1.0	0.9	0.8	0.7
<b>PV of Free Cash Flow</b>	<b>(477.5)</b>	<b>211.9</b>	<b>1131.1</b>	<b>2201.6</b>	<b>1863.6</b>
Cumulative Cash Flow	(477.52)	(265.58)	865.54	3067.17	4930.74

### Sensitivity Analysis

		WACC (%)				
Terminal Growth (%)	9.2%	10.2%	11.2%	12.2%	13.2%	
2.0%	597	520	460	412	373	
3.0%	661	565	493	437	392	
4.0%	750	626	<b>536</b>	468	416	
5.0%	883	710	593	509	445	
6.0%	1,098	834	672	562	483	

**DCF valuation per share (Rs mn)**

<b>Terminal Value (N+1)</b>	54567.2
Discounted Terminal Value	23389.7
Present Value of Firm till Terminal Year	13481.1
Total Discounted Value of Firm	36870.8
Net Debt (adj for Cash)	(1393.1)
Present Value of Equity	38264.0
No. of Equity Shares (mn)	71.4
Value Per Share (Rs)	536

**Assumptions**

Growth Rate (CY12-CY16)	8.0
Growth Rate (Post 2016)	4.0
Risk Free rate	8.5
Market Risk Premium	7.0
Adjusted Beta	0.6
Cost of Equity	12.7
Cost of Debt	12.0
Cost of Debt	7.92
Average debt	3,72.5
Shareholders Funds	7,377.5
Average Capital Emp	10,849.9
WACC	11.2

**Peer Group Comparison**

The table below clearly indicates that Panacea Biotec is currently trading at a discount to its peers. We believe it deserves a higher valuation when we consider the following facts

- Highest growth in earnings (CAGR of 29%) compared to its peers
- Steady EBIDTA and PAT margins
- Strong return on equity (24% in FY09)
- At CMP of Rs.385, it is trading at a 35% discount to its peers on one year forward P/E and a 48% discount on EV/EBIDTA

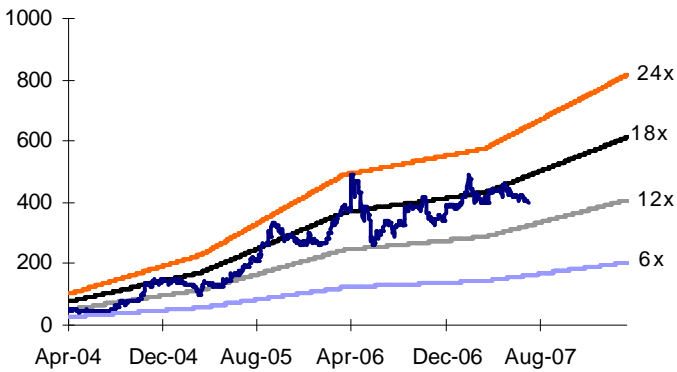
	CMP	Mkt Cap Rs mn	EBITDA Margin (%)			PAT Margin (%)			EPS (Rs) CAGR%			
			FY07	FY08	FY09	FY07	FY08	FY09	FY07	FY08	FY09	FY07-09
LUPIN	724.8	58508	14.5	18.0	17.1	15.3	12.6	12.5	37.8	38.3	42.4	6%
BIOCON	448.6	44860	28.8	28.2	27.8	20.3	20.0	19.8	20.7	23.1	28.0	16%
CADILA HEALTH	369.0	46345	16.9	19.9	19.8	13.1	13.3	13.7	18.6	22.5	26.9	20%
PANACEA	400.0	26560	26.6	26.1	28.5	17.2	17.0	19.3	20.4	22.8	33.8	29%

	PE (x)		EV/EBITDA (x)			ROE (%)			EV/Net Sales			
	FY07	FY08	FY09	FY07	FY08	FY09	FY07	FY08	FY09	FY07	FY08	FY09
LUPIN	19.2	18.9	17.1	23.1	15.0	13.7	31.7	32.4	26.8	3.35	2.69	2.36
BIOCON	21.7	19.4	16.0	16.0	13.8	11.9	19.7	20.0	20.3	4.61	3.89	3.31
CADILA HEALTH	19.8	16.4	13.7	16.7	11.8	10.2	27.4	28.9	28.1	2.81	2.34	2.02
PANACEA	18.9	16.7	11.3	12.4	11.0	7.8	32.5	20.2	24.0	3.28	2.89	2.25

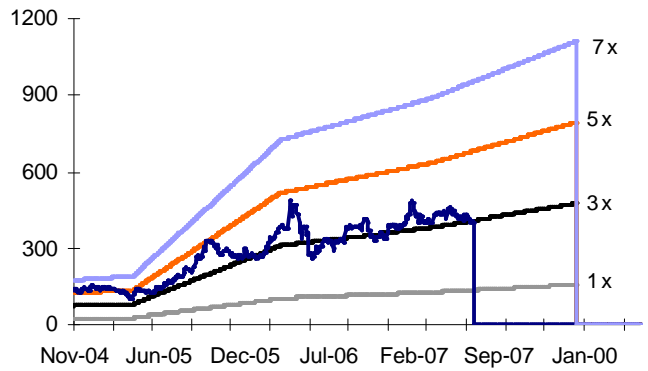
Source: Emkay research, Capitalline

Strong earnings growth of over 29% pa, 24% RoE, strong cash accruals and cheaper valuations as compared to peers warrant a Buy on Panacea Biotec. At CMP of Rs.385, stock is trading at 16.7x of FY08E EPS of Rs.23.1 and 11.3x of FY09 EPS of Rs.34. We believe that Panacea Biotec is an excellent opportunity for investment. We initiate coverage on the stock with a Buy and a DCF based target price of Rs.536

Panacea Biotec-PE Band

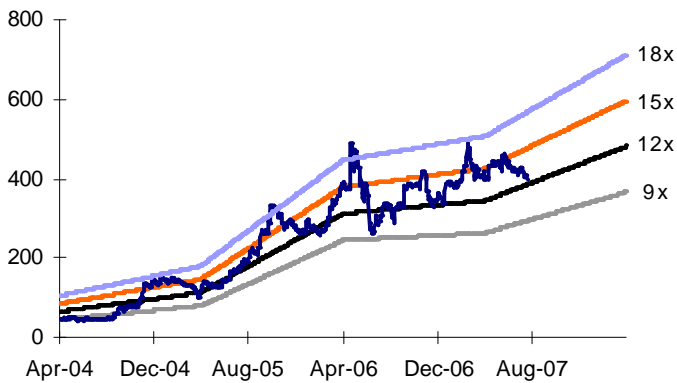


Panacea Biotec-PB Band

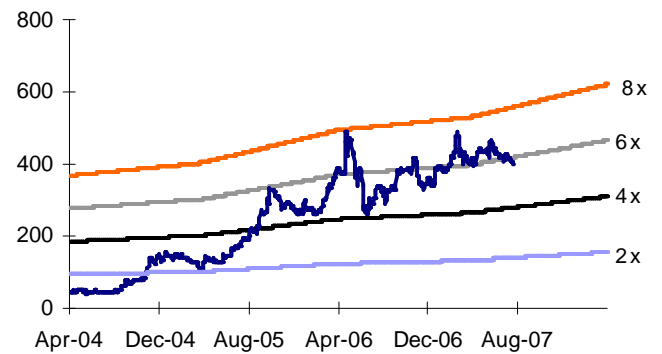


Source: Emkay research

Panacea Biotec-EV/EBitda Band

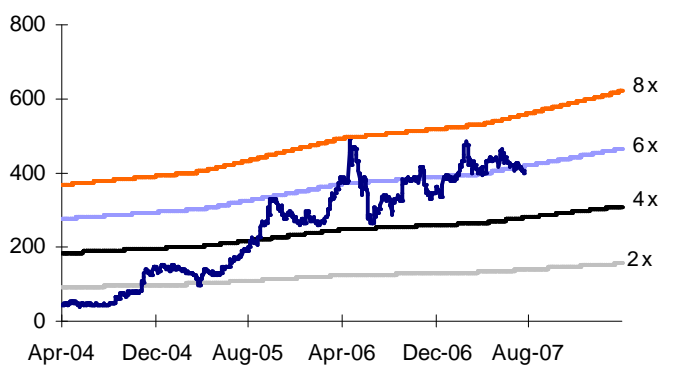


Panacea Biotec-Mkt Cap/Sales Band



Source: Emkay research

Panacea Biotec-EV/Sales Band



Source: Emkay research

## Annexure 1: Biotech Sector- An Overview

*Industry majors foresee a wave that could throw Indian biotech in to the big league*

### Biotechnology- Technology of hope

"Inspired by the tech growth story, the Indian biotech sector is striving to move to the big league."

As the IT industry reaffirmed its \$50bn promise recently, the fledgling biotech sector seems to be getting ready to raise the bar too.

Industry majors foresee a wave that could throw Indian biotech - miniscule compared to the IT sector, but high on potential- in to the big league. Going forward, they expect biotech sector to surpass the target- \$5bn by 2010 from the current \$2bn and record growth much faster than the IT sector.

*Sustaining a 30% growth for 5 continuous years indicates that the industry is maturing*

### Indian biotech industry crosses the \$2bn mark

The Indian biotech industry has achieved another milestone by crossing the US\$2bn mark in 2006-07. Sustaining a 30% growth for 5 continuous years and that too on a base of \$1.45bn, indicates that the industry is maturing.

#### Biotech Industry Revenues

Sector	Sales \$ mn				Change (%) 2006-07
	2004	2005	2006	2007	
Biopharma	65.5	85.0	112.1	142.2	26.87
Bioservices	6.5	10.1	17.1	26.2	53.06
Bioagri	3.1	7.9	14.2	22.0	54.85
Bio industrial	5.7	7.6	8.9	9.4	5.33
BioInformatics	1.9	2.4	2.9	3.5	20.83
Total Industry Size	82.7	113.7	155.3	203.4	30.98

\* Source: Biospectrum-ABLE survey 2007

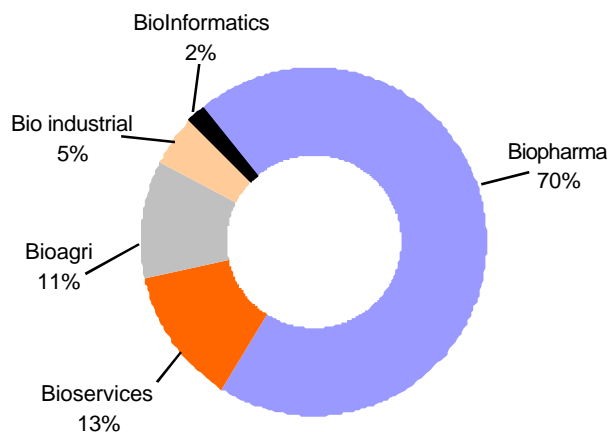
Biotech exports have recorded \$1.2bn revenues (47% growth over the last year), accounting for 58% of the total revenues.

### Biopharma- the largest contributor

*Biopharma accounts for 70% of total biotech revenues*

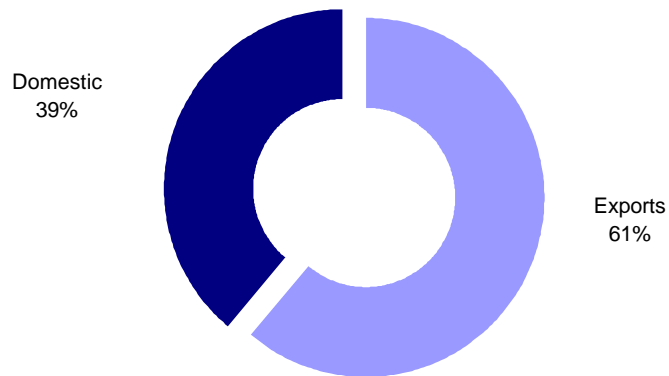
Biopharma, the largest segment, accounting for 74% of the total exports and 70% of total biotech revenues, recorded revenues of about \$1.4bn. This segment registered a 27% growth, driven primarily by the vaccine business.

#### Segment wise contribution



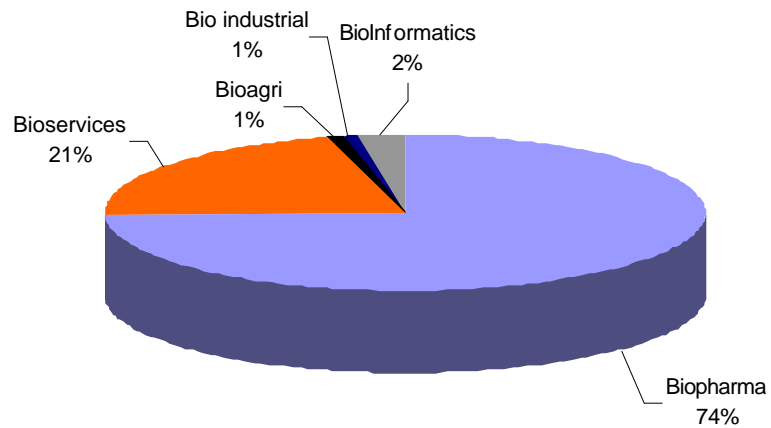
Source: Emkay research

## Biopharma- Exports vs Domestic Sales



Source: Emkay research

## Segments contribution to exports



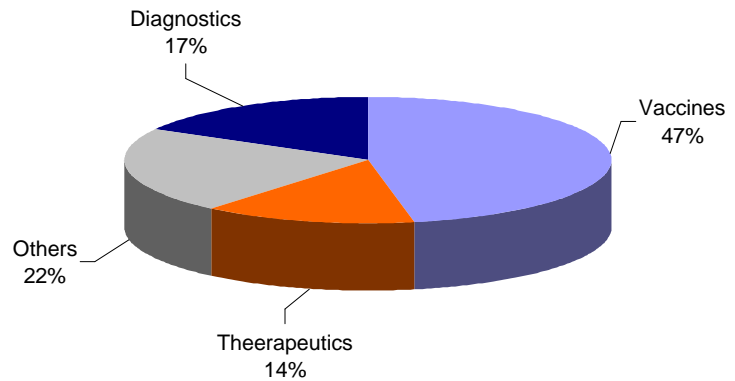
Source: Emkay research

Vaccine contributes 47% of total bio-pharma market

### Vaccines- "Weapons of mass protection"

- Major pie of Bio-pharma market accounting for 47%.
- India is the largest producer of recombinant Hepatitis B vaccine in the world.
- Exports are a major contributor to India's vaccine sales
- Several vaccines are produced from India in large volumes by GAVI (Global Alliance for Vaccine and Immunization)
- Strong capabilities in vaccine development and manufacturing
- Current focus on development of combination vaccines
- Public institutes leading new vaccine research

## Biopharma- Segment wise contribution



Source: Emkay research

*India is becoming a partner of choice for biotech globally*

### Global tie-ups to develop and market vaccines in India

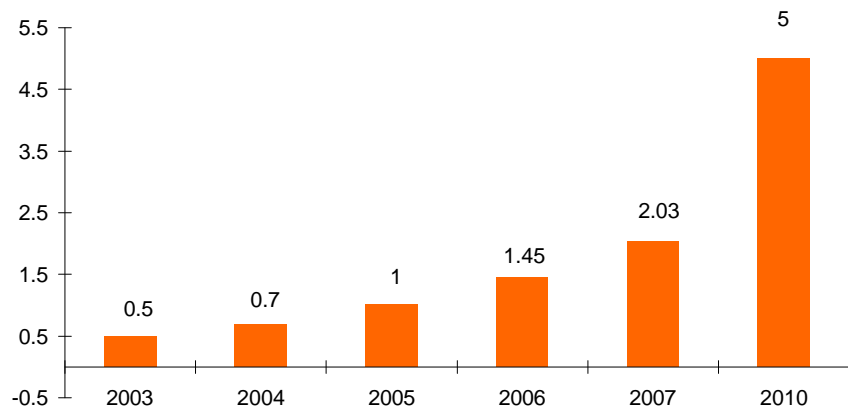
1. Panacea Biotec signed an agreement with PT Bio Farma, Indonesia, to manufacture and market the measles vaccine
2. Merieux Alliance has acquired a majority stake in Shantha Biotechnics Ltd.
3. Serum Institutes has picked up a 14% stake in the UK based Lipoxen, a biopharmaceutical company specializing in the development of differentiated biologicals, vaccines and oncology drugs.
4. Intas Biopharmaceuticals has entered into a strategic R&D agreement with the US based Virionics Corporation for development of Human Papilloma virus -therapeutic vaccine, useful for treatment of cervical cancer.
5. Sanofi Pasteur has introduced Vaxigrip, its global preventive vaccine against influenza in India.

*Indian biotech industry is set to touch \$5bn in revenues by 2010*

### Indian biotech market poised to reach \$5bn by 2010

The Indian biotech industry today comprises over 325 companies with three of them (Serum institute, Biocon and Panacea Biotec) generating revenues of over \$540mn. In 2005-06, top 20 biotech companies have accounted for 61.9% of the total business. With the product patent regime in place, the Indian biotech industry is set to touch \$5bn in revenues by 2010.

#### Indian Biotech industry by 2010 (\$ bn)



\* Source: ABLE-2007 and industry estimate

**Top 20 Biotech company**

Company	Revenues in 2006(Rs. Cr.)	Growth (%)
Serum Institute	703	39.2
Biocon	688	6.4
Panacea Biotec	438	101.5
Mahyco Monsanto	391	140.6
Rasi Seeds	309	256.2
Venkateshwara Hatcheries	280	48.9
Novo Nordisk	175	29.6
Mahyco Monsanto	118	-29.2
Aventis Pharma	115	35.8
Indian immunologicals	103	41.8
GlaxoSmithkline	94	20.8
Eli Lilly	85	24.3
Novozymes	83	20.3
Shantha Biotechnics	82	23.9
Bharat serum	78	-3.6
Intervet	65	15
Nuziveedu	63	NA
Ranbaxy	61	NA
Advanced Enzyme	56	31.4
Wockhardt	50	NA

\* Source: Biospectrum-ABLE survey 2006

**Biotech- India's advantage***India's value proposition for Boitech*

- 300 institutes offering training in the field of biotechnology, bioinformatics and the biological sciences
- A vast knowledge pool of 15,000 Phds, 7,00,000 post graduates and 3mn graduates in biosciences
- Indian talents are being exposed to cutting edge technologies because of strong multinational presence
- Robust IT industry
- Presence of a strong base industry, that is the pharmaceutical industry



### Recent introductions in Bio-pharma

*In 2007, 17 recombinant products approved for marketing in India*

Today, there are close to 17 recombinant products approved for marketing in India, according to Indian GMO Research Information System (IGMORIS), compared to 12 in 2005-06. Some of the new and innovative products that have been launched in 2005-06 are:

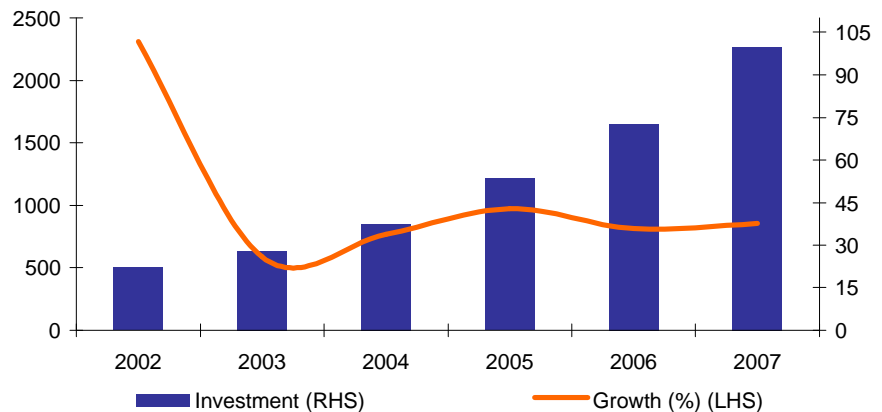
1. Serum Institute has launched its indigenously developed H1B vaccine and will supply this new age vaccine to GAVI, PAHO (Pan American Health Organization) and UNICEF
2. Biocon launched BIOMAb-EGFR, a therapeutic monoclonal antibody based drug for treating solid tumors of epithelial origin, such as head and neck cancers
3. Panacea Biotec launched Siropan for renal disease management, Lower A for dyslipidaemia, Myelogen Forte and Inrica for neuropathy
4. Dabur Pharma launched Nanoxel, a new version of an existing anti-cancer drug Paclitaxel
5. Bharat Biotech has launched an anti-rabies vaccine, Rabirix, for both prophylactic and therapeutic treatments
6. Dr. Reddy's laboratories has launched Redituxa (rituximab), a monoclonal antibody (Mab) used in the treatment of Non-Hodgkin's Lymphoma

### Investments in R&D and infrastructure during 2003-07

*Investment in R&D increased by 38% over previous year*

Investment crossed \$540mn in 2006-07, a 38% increase over the previous year. Both R&D as well as infrastructure investments are on the rise, accounting for close to 27% of the turnover .

#### Investment Track (Rs. cr)



Source: Emkay research

As per Mr. Aditya Sapru, MD, Frost and Sullivan, " Leveraging the strengths of trained manpower, low operational costs, cost-effective technologies and cheaper raw materials- India's biotech sector is showing the potential to generate one million jobs by 2010 and achieve revenue to the tune of \$5bn."

*Biotech is going to be the next big thing happening for India after IT revolution*

The Indian story has begun and it is by no means over. The importance of moving ahead with services and innovation together is the need of the hour and is going to put biotech as the next big thing happening for India after the IT revolution.

## Annexure 2: Global Vaccine Market Overview

*Global vaccine market is expected to touch \$20bn by 2011*

The global vaccine market size is estimated at US\$8-10bn and is expected to grow to US\$20bn by 2011 at a CAGR of around 17% as per the industry estimates. Key growth drivers for vaccine markets are:

- 1) Increased vaccination programmes worldwide with emphasis on
  - Pediatric Immunization programmes (this segment dominates the market with a 42.3% market share and is expected to grow at a CAGR of 20% till 2010)
  - Emerging diseases in developing countries
- 2) Development of new combination vaccines
- 3) Increased demand due to global bio-terrorism like stockpiles in the US
- 4) Increased focus on developing innovative vaccines for diseases for which no vaccines are available

In the global market, approximately 42% of the revenues come from the US and 33% from the European Union.

### Key entry barriers

- Highly technology and R&D driven
- Capital intensive
- Long gestation periods

### Indian vaccine industry overview

*Private vaccine market is shifting from single traditional vaccines to new innovative combination vaccines*

The Indian vaccine market is estimated to be around US\$500mn with a private vaccine market of US\$125mn, growing at 20% per annum. Though the Indian vaccine market is primarily dominated by traditional vaccines like Tetanus, DPT, Polio, Typhoid and Hepatitis-B, the private vaccine market is now shifting from single traditional vaccines to new innovative combination vaccines like Hep.B+ DTP, Hep.B+ DTP+ Hib and Hib+ DTP.

The government immunization program guides the primary demand for vaccines, which is in line with WHO universal immunization policy. This policy recommends universal immunization of all children to reduce child mortality.

The proposed National Biotechnology Policy is expected to provide the much needed funding for augmenting startups and supporting product development. Given the right impetus and with India positioning itself as the preferred global destination for biotechnology, Indian companies are poised to feature among the top 10 biotech companies globally by 2015.

### Polio- Current scenario

*WHO's initial target of eradicating polio globally by 2000 has been revised to 2008*

Globally, the launch of WHO's global polio eradication programme fuelled the polio eradication activities in 1988. The WHO's initial target of eradicating polio globally by 2000 has been revised to 2008 to incorporate solutions for practical difficulties faced during the past. However, there has been a significant progress in combating the deadly disease. The number of countries affected by polio has come down rapidly from 125 countries in 1988 to 4 countries in 2005, namely India, Nigeria, Pakistan and Afghanistan. India is the second largest country (Nigeria has reported maximum number of cases) affected by polio.

From an estimated 3,50,000 cases in 1988 world wide, the total number of cases come down to around 190 in 2007(till 5th June'07). India has registered significant achievements in polio eradication and the number of cases reduced from 25,000 in 1988 to just 60 in 2007 (till 5th June). However, in 2006, there was a sudden rise in the polio cases (676), mainly in UP and Bihar states.

## Global Scenario

### Number of Polio cases Reported In 2007

Total cases	Year-to-Date 2007	Year-to-Date 2006	Total In 2006
Globally	190	460	1997
In endemic countries**	161	421	1870
In non endemic countries	29	39	127

\*Source: WHO

\*\* Endemic countries- Nigeria, India, Pakistan and Afghanistan

\*\*\* Year to date as on 5th June

### Break up of Polio cases

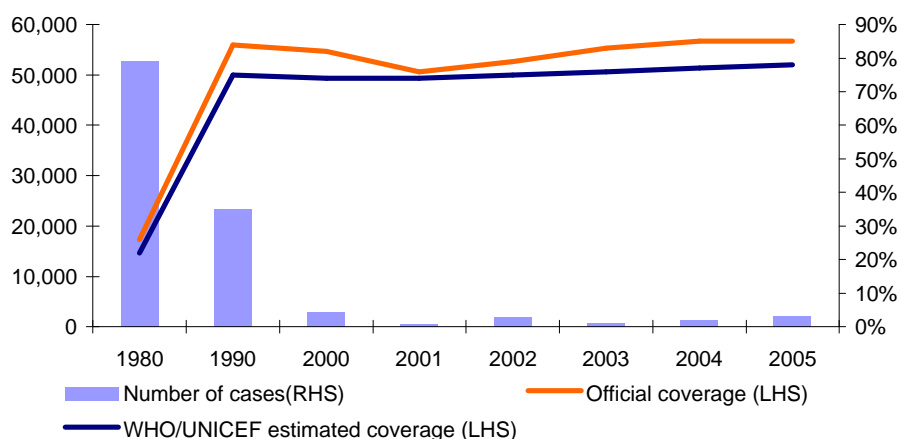
Country	Year-to-Date 2007	Year-to-Date 2006	Total In 2006
India	60	36	676
Pakistan	8	3	40
Nigeria	91	372	1123
Afghanistan	2	10	31
Angola	1	0	2
Myanmar	5	0	0
Nepal	0	1	5
Bangladesh	0	3	18
Somalia	8	25	35
Cameroon	0	0	2
Ethiopia	0	3	17
Namibia	0	0	18
Indonesia	0	2	2
Yemen	0	1	1
Kenya	0	0	2

\*Source: WHO

### Annual Reported Cases and estimated coverage of Polio in India

Years	Years	Number of cases	Gol estimated coverage	WHO/UNICEF estimated coverage
1980	1980	18,975	42%	2%
1990	1990	10,408	99%	66%
2000	2000	265	95%	60%
2001	2001	268	70%	58%
2002	2002	1,600	70%	58%
2003	2003	225	82%	58%
2004	2004	134	88%	58%
2005	2005	66	90%	58%

### Polio Globally Annual reported Incidence and Estimated Coverage



\*Source: WHO

### WHO guidelines to certify Polio free region

*WHO region can be certified polio free only if it does not record any case of polio during three consecutive years*

As per WHO guidelines, a WHO region can be certified polio free only if it does not record any case of polio during three consecutive years following the year in which zero case is registered first time. India has registered 60 cases (Till 5th June) of polio in CY2007 and hopes to register zero case for the first time in CY2008. Thereafter, if it does not record any case of polio in 2009, 2010 and 2011, India can achieve its target of becoming a polio free country. However, immunization activities may continue until entire region (Pakistan and Afghanistan) become a polio free nation.

Considering the above facts, we believe polio immunization with OPV will continue at least till 2011 and thereafter it will be gradually phased out depending upon polio eradication status in neighboring countries and in post eradication era, the mode of polio immunization will change from oral route to injectable, for which Panacea Biotec is already working.

Thus going forward, polio business will continue to be one of the major source of revenue for next 4-5 years, however the pace of growth may come down.

## Income Statement

March (Rs. in mn)	FY05	FY06	FY07	FY08E	FY09E
<b>Net Sales</b>	<b>3279</b>	<b>5419</b>	<b>8424</b>	<b>9602</b>	<b>12381</b>
Growth (%)	25	65	55	14	29
<b>Expenses</b>	<b>2679</b>	<b>4228</b>	<b>6185</b>	<b>7079</b>	<b>8803</b>
Growth (%)	19	58	46	14	24
Raw Materials	1575	2678	3837	4369	5507
% of sales	48	49	46	46	44
Employee cost	373	460	834	951	1189
% of sales	11	8	10	10	10
Manufacturing exps	198	320	413	442	496
% of sales	6	6	5	5	4
R&D	141	281	500	650	813
% of sales	4	5	6	7	7
Selling & Dist exps	394	489	600	666	800
% of sales	12	9	7	7	6
<b>EBIDTA</b>	<b>600</b>	<b>1191</b>	<b>2239</b>	<b>2523</b>	<b>3578</b>
Growth (%)	55	99	88	13	42
<b>EBIDTA %</b>	<b>18.3</b>	<b>22.0</b>	<b>26.6</b>	<b>26.3</b>	<b>28.9</b>
Other income	56	72	305	160	150
Interest	114	133	152	27	36
Depreciation	140	143	273	368	460
Misc. Exp. W/O	0				
<b>PBT</b>	<b>402</b>	<b>987</b>	<b>2119</b>	<b>2287</b>	<b>3231</b>
Total Tax	129	394	642	640	808
Effective tax rate (%)	32	40	30	28	25
<b>PAT ( Before E/O items)</b>	<b>273</b>	<b>593</b>	<b>1477</b>	<b>1647</b>	<b>2423</b>
<b>E/O items</b>	<b>(12)</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Pref. Div.</b>	<b>49.7</b>	<b>46.4</b>	<b>23.8</b>	<b>0.0</b>	<b>0.0</b>
<b>APAT</b>	<b>235</b>	<b>545</b>	<b>1453</b>	<b>1647</b>	<b>2423</b>
Growth (%)	54	132	167	13	47
<b>NPM</b>	<b>7.2</b>	<b>10.1</b>	<b>17.2</b>	<b>17.2</b>	<b>19.6</b>

Source: Company, Emkay research

## Cash Flow Statement

March (Rs. in mn)	FY05	FY06	FY07	FY08E	FY09E
Pre-tax profit	402	987	2119	2287	3231
Depreciation	140	143	273	368	460
Chg in working cap	(284)	602	(860)	(821)	(650)
Tax paid	(69)	(283)	(506)	(640)	(808)
<b>Operating cash Inflow</b>	<b>189</b>	<b>1449</b>	<b>1026</b>	<b>1194</b>	<b>2233</b>
Capital expenditure	(439)	(1135)	(1496)	(1000)	(1000)
<b>Free Cash Flow</b>	<b>(250)</b>	<b>315</b>	<b>(470)</b>	<b>194</b>	<b>1233</b>
Investments	1	0	(168)	0	0
Equity Capital Raised	0	-144	4450	0	0
Loans Taken / (Repaid)	(123)	4252	(6589)	100	50
Dividend (incl tax)	(147)	(112)	(101)	(84)	(84)
Others	(28)	34	0	0	0
Increase in Msc Exp	5	5	0	0	0
<b>Net chg in cash</b>	<b>(542)</b>	<b>4349</b>	<b>(2878)</b>	<b>210</b>	<b>1200</b>
<b>Opening cash position</b>	<b>642</b>	<b>100</b>	<b>4449</b>	<b>1571</b>	<b>1782</b>
<b>Closing cash position</b>	<b>100</b>	<b>4449</b>	<b>1571</b>	<b>1782</b>	<b>2982</b>

Source: Company, Emkay research

## Balance Sheet

March (Rs. in mn)	FY05	FY06	FY07	FY08E	FY09E
Equity share capital	57	57	71	71	71
Share Premim	169	25	4460	4460	4460
Other Reserves	990	1470	2846	4409	6749
<b>Networth</b>	<b>1216</b>	<b>1552</b>	<b>7377</b>	<b>8941</b>	<b>11281</b>
<b>Deferred tax liability</b>	<b>136</b>	<b>247</b>	<b>383</b>	<b>383</b>	<b>383</b>
Diventure/pref. Share	904	5367	0	0	0
Secured Loans	510	380	178	178	178
Unsecured Loans	1101	1020	1	101	151
<b>Loan Funds</b>	<b>1611</b>	<b>1400</b>	<b>178</b>	<b>278</b>	<b>328</b>
<b>Total Liabilities</b>	<b>3867</b>	<b>8566</b>	<b>7938</b>	<b>9602</b>	<b>11992</b>
Gross Block	1681	2134	4597	5597	6597
Less: Depreciation	561	740	1012	1381	1841
<b>Net block</b>	<b>1120</b>	<b>1394</b>	<b>3584</b>	<b>4216</b>	<b>4756</b>
<b>Capital work in progress</b>	<b>285</b>	<b>967</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Investment</b>	<b>0</b>	<b>0</b>	<b>168</b>	<b>168</b>	<b>168</b>
<b>Current Assets</b>	<b>3291</b>	<b>7734</b>	<b>5762</b>	<b>6449</b>	<b>8602</b>
Inventories	1934	1817	2153	2482	3088
Sundry debtors	786	767	1053	1200	1548
Cash & bank balance	100	4449	1571	1782	2982
Loans & advances	471	701	985	985	985
Other assets	0	0	0	0	0
<b>Current liabilities</b>	<b>844</b>	<b>1539</b>	<b>1585</b>	<b>1241</b>	<b>1544</b>
Current liabilities	601	1030	1076	1241	1544
Provisions	243	509	509	0	0
<b>Net current assets</b>	<b>2447</b>	<b>6195</b>	<b>4176</b>	<b>5208</b>	<b>7058</b>
<b>Misc expenditure</b>	<b>14</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>
<b>Total Assets</b>	<b>3867</b>	<b>8566</b>	<b>7938</b>	<b>9602</b>	<b>11992</b>

Source: Company, Emkay research

## Key Ratios (%)

March	FY05	FY06	FY07	FY08E	FY09E
Profitability (%)					
EBIDTA margin	18.3	22.0	26.6	26.3	28.9
PAT margin	7.2	10.1	17.2	17.2	19.6
ROCE	11.2	15.8	22.3	23.7	28.7
ROE	20.4	39.4	32.5	20.2	24.0
<b>Per share data (Rs.)</b>					
EPS (Consolidated)	4.1	7.6	20.4	23.1	34.0
CEPS	6.6	12.1	24.2	28.2	40.4
BVPS	21.3	27.2	103.4	125.3	158.0
DPS (Rs)	1.5	1.0	1.0	1.0	1.0
<b>Valuations</b>					
P/E	93.6	50.4	18.9	16.7	11.3
Cash PE	58.7	31.9	15.9	13.6	9.5
P/BV	18.1	14.2	3.7	3.1	2.4
EV / Net Sales	7.2	4.3	3.3	2.9	2.2
EV / EBITDA	39.3	19.6	12.4	11.0	7.8
Dividend Yield (%)	0.4	0.3	0.3	0.3	0.3
<b>Turnover (x) Days</b>					
Debtors T/O	87.5	51.6	45.0	45.0	45.0
Inventory T/O	215.3	122.4	90.0	90.0	90.0
<b>Gearing Ratio</b>					
Total Debt/Equity (x)	1.3	0.9	0.0	0.0	0.0

Source: Company, Emkay research

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BUY	Expected total return (%) of stock price appreciation and dividend yield) of over 25% within the next 12-18 months.		
ACCUMULATE	Expected total return (%) of stock price appreciation and dividend yield) of over 10% within the next 12-18 months.		
REDUCE	Expected total return (%) of stock price appreciation and dividend yield) of below 10% within the next 12-18 months.		
SELL	The stock is believed to under perform the broad market indices or its related universe within the next 12-18 months.		
NEUTRAL	Analyst has no investment opinion on the stock under review.		
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