



# Opportunity India

## Biotechnology

Today, India is one of the most exciting emerging markets in the world. Skilled managerial and technical manpower that match the best available in the world and a middle class whose size exceeds the population of the USA or the European Union, provide India with a distinct cutting edge in global competition.

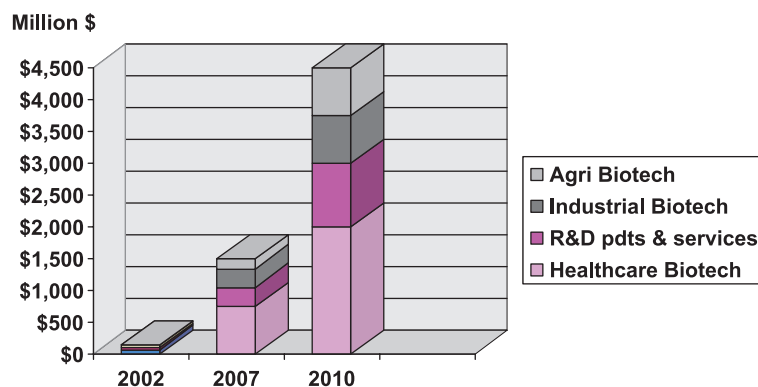
There are several factors that create the impetus for India to develop exceptional capabilities in the realm of Biotechnology. A large reservoir of scientific human resource, centers of academic excellence in biosciences, a vibrant pharmaceutical industry, and fast developing clinical capabilities collectively point to a booming biotechnology sector in the future.

The Indian biotechnology sector is poised for exponential growth over the next five years with an expected global market share of 10 percent. Indigenous biotech products and services presently account for approximately \$150 million. The current segmentation is shared equally between Human therapeutics such as vaccines and biogenerics, contract research services including r-DNA technologies, genomics & bioinformatics, and industrial products such as industrial enzymes, diagnostics, and bioprocessing equipment and instrumentation. An emerging segment is Agri-biotech, which is expected to realize rapid growth over the next five years and will account for at least 15 percent of the total indigenous biotech market. The consumption of biotech products in India is estimated to increase ten-fold to \$ 1.5 billion by 2007 and to \$ 4.5 billion by 2010.

### Bio-Statistics in India: 2002

- There are 150 BT companies in India
- 75 per cent of these companies have been established in the last 5 years
- The 2002 revenue forecast for BT cos. is \$150m
- The export revenues are forecast at \$60m
- VC funding has been modest at \$20 million
- Total investment to date by Biotech companies is \$100 million
- Employment strength of scientific personnel in the BT sector stands at 15,000

### Biotech Business Segmentation & Growth Forecast 2002 to 2010



## Advantage India: A centre for Bio-resources

**Human resources:** large English speaking skill base: 700,000 post graduates & 1500 PhDs qualify in bio-sciences and engineering each year. Currently 60 Biotech companies engaged in Modern Biology employ 5000 scientists & qualified personnel. Thirty per cent of these are employed in R&D. There is also access to intellectual resources of the Indian diaspora, which is also making rapid advancements in biotechnology enterprises, especially in the US.

**Extensive clinical trials and research:** Access to vast & diverse disease populations. Indian companies, hospitals & clinics are beginning to comply with GCP guidelines.

**Bio-diversity:** India's human gene pools offer an exciting opportunity for genomic research. Unique and diverse plant, animal and microbial bio-diversity also provides exciting research opportunities.

**Strong Bio-processing skills:** Indian pharma sector is globally competitive in fermentation derived pharmaceuticals – can be leveraged for the production of biogenerics.

**Stem cells:** Several labs have commenced research in stem cells and have valuable stem cell lines.

## Bio-Enablers: The Policy Front

The Government of India had the foresight to identify Biotechnology as a thrust sector for development in 1986 when it set up the Department of Biotechnology (DBT) as a nodal agency for policy making and development. This is now focusing on frontier areas such as genomics, proteomics, transgenics, stem cell research, and product development.

**Budgetary Allocation:** The budgetary allocation to Biotechnology has increased from an amount of \$150 million during the first phase: 1987-1988 to \$ 300 million in the fiscal year 1997-1998 and \$ 500 million in the fiscal year 2002-2003. The Ministry of Science & Technology also plans to introduce additional venture capital funds in line with its technology development fund (TDF) to promote small and medium biotech enterprises.

**Regulatory Framework:** A well-conceived regulatory framework is in place to approve GM crops and r-DNA products for human health based on independent appraisal and approval bodies to ensure high levels of human and environmental safety. A proactive government policy allows stem cell research in the country based on sound ethical guidelines.

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