

**On The Occasion Of Hon'ble Prime Minister Of India CII Presents**  
**Survey Number 3 China's BioTechnology Market"**

**Industry Overview**

The State Science and Technology Commission in China is the government agency concerned with science and technology policy and resource allocation. Within this organization, the China National Center for Biotechnology Development has been established. The government's role in the biotechnology field is crucial. Three central government plans combined with China's exponential economic growth are expected to spur sales and exports of high-technology products and account for 15 percent of both China's GNP and total exports by the year 2002. China already has a number of established biotech companies (see below)

***Major Chinese Biotech Companies***

**North China Pharmaceutical Corporation** -- Largest pharmaceutical company in China; produces pharmaceuticals; conducts scale-up of DNA-based processes; plans to produce Interferons using recombinant organisms.

**Changchun Institute of Biological Products** -- produces vaccines, diagnostic kits, and blood products; conducts process studies for interferon production.

**Wuxi Enzyme Factory** -- Largest enzyme producer in China; produces enzymes used in starch processing and the leather and pharmaceutical industries.

**East China Biotechnology Engineering Company** -- Manufactures microcomputer-controlled bioreactors; specializes in process engineering; develops microcarriers for animal cell cultures..

In 1988, China's central government launched the Torch Plan, designed to develop and commercialize high-tech (including biotech) products. Since

then, China has established nearly 120 high-and new-technology development zones that in 1993 alone generated about \$10 million. These zones attract domestic and foreign investment by offering incentives such as tax breaks and administrative support.

Beijing's official successor to the Torch Plan, the 863 Plan (also known as the National High-Tech Research and Development Program), concentrates specifically on high-tech medicines and vaccines, protein engineering, and gene therapy. In addition, China developed the China Torch Plan New High Technology Investment Foundation, with at least \$120 million at its disposal, to market Chinese high-tech products on the international market. A number of the targeted products are biotech-related.

The Chinese biotechnology industry has produced considerable results with a budget considered very small by Western standards. In fact, much of the research conducted in China today is comparable with projects under way in the West. A Chinese scientist with experience working at the U.S. National Institutes of Health recently headed a project in China that claims to have successfully treated two children with hemophilia.

Fudan University's Human Genome Laboratory in Shanghai is mapping and sequencing the human X chromosome. And Zhonglian Company in Beijing claims that its TG901A products may be able to kill the virus that causes AIDS. Evidence suggests that the products may also work against syphilis and gonorrhea.

**Four types of institutions in China engage in biotechnology activity:**

- ❖ Laboratories associated with Academia Sinica (a government-run academic think tank),
- ❖ University institutes,
- ❖ medical schools,
- ❖ Six specialized biotechnology production facilities.

In total, approximately 10,000 high-level scientists, many of whom were educated or have worked abroad, are currently working on approximately 1,000 biotechnology projects. One hundred of those projects are government-sponsored key projects.

Key projects, considered essential to China's development, receive priority funding from the central government. The central government provides about one-third of the funds for biotechnology research, and the remainder of the funding is provided by :

- ❖ local governments,
- ❖ international grants,
- ❖ payments from hospitals and pharmaceutical companies,
- ❖ the ministries of agriculture
- ❖ public health, product sales, the military, and other sources.

### **Searching for Opportunities**

To further speed development, the Chinese government encourages Chinese companies to establish links with western biotechnology companies; licensing agreements have existed since as early as the 1970s. By 1992, the government had founded 17 national biotechnology laboratories open to both domestic and foreign scientists. In 1985, China's government enacted a patent act that covers aspects of biotechnology and, at least in part, protects foreign companies that attempt to penetrate the Chinese market. In practice, however, intellectual property rights laws are not enforced according to the same standards Westerners expect in their own countries.

### **ISSUES**

China suffers from immense environmental pollution, especially from the dust of coal combustion -- coal is still a common source of heat used for daily living and commercial activities. Chinese construction is of relatively low quality, so many pollutants contaminate biotechnology research laboratories.

The current difficulty in attracting investment capital to China's biotech market

also stems from the impression of many Chinese and overseas investors that in comparison with investment in real estate or consumer products, the rate of return on investment in biotech is very low. Adding to the problem is the minimal understanding that many institutional investor groups in China have of biotechnology and frequent misunderstandings between corporate managers and investors.

### **The Life Science Market**

According to CII survey, the market demand for biotech reagents required by Chinese institutes engaged in lifescience research provides one good example of development opportunities. The government's devotion to developing life science research guarantees a long-term, growing demand for reagents.

More than 90 percent of the funds spent on biotech reagents come from research institutes relying on some form of government funds. Approximately 30 percent of these funds comes from the State Natural Science Foundations, 30 percent from key state laboratory research funds, 20 percent from key state scientific research funds, 10 percent from the budgets of individual institutes, and 5 percent from the 863 Plan.

Currently, China is incapable of producing the high-quality reagents necessary for the level of research its government demands. The life science research industry in China is very new, which implies extended growth for the future. China must therefore rely on imports over the long term. The reagent market is expected to grow more than 60 percent annually through 1998.

Current problems experienced by Chinese life science research institutes trying to obtain reagents from abroad include high prices, few product catalogs, long delivery delays, and a lack of ready stock. Very few organizations in China are conducting life science research, and most are

located in Beijing and Shanghai. Therefore, it is relatively easy for interested suppliers to develop relationships with their clients and to make direct sales.

**The five most promising categories in China's reagent industry are :**

- ❖ Immuno-blotting,
- ❖ Sanger sequencing,
- ❖ in situ hybridization,
- ❖ chromosome mapping,
- ❖ bacteriophage plaque.

Eighty-two percent of these sales were imports, and 70 percent of these imports came from U.S. suppliers. Germany, the United Kingdom, and Switzerland also export reagents to China.

**How to Be a Player in the Chinese Marketplace**

The three main strategies for Indian biotech companies to enter China's marketplace are exporting, licensing, and setting up a wholly foreign-owned enterprise (WFOE) or joint venture.

- ❖ **Exporting:** Using a third party (a Hong Kong distributor, for example) to export to

China is the easiest way to market products there but generally is not a good long-term strategy. The higher prices, which include a distributor's margin, limit market penetration. Additionally, the Chinese government does not favor imports, and tariffs and quotas can be volatile. Another disadvantage of this method is the loss of control over market-entry strategy. Some manufacturers therefore choose to build a sales force within China, which provides greater control over marketing and sales and lower prices. Building a sales force, however, often requires significant time to identify, qualify, and develop relationships with potential Chinese buyers.

- ❖ **Licensing.** Some companies license their products in China. Although licensing may be a good option for companies seeking less actual

involvement in China, these agreements must be negotiated very carefully. Chinese authorities on local, regional, and national levels often must approve licensing agreements, which can be negotiated to last for only finite periods. Foreign companies sometimes find that it is difficult to monitor actual sales of their products licensed in China, making it hard to determine whether the Chinese company is paying the foreign company the correct royalties.

- ❖ **Joint Ventures.** A joint venture offers the best long-term market-penetration strategy for biotechnology, even though joint ventures are more time consuming and more expensive to set up than other strategies. Joint ventures are mutually beneficial partnerships -- a Chinese company gains foreign technology and a foreign company reaps the profits of effectively penetrating China's market. Usually a Western partner provides technology, management skills and a marketing strategy, and a Chinese partner offers land, facilities, labor, and access to the Chinese market, thereby greasing the wheels of the Chinese system. Many successful biotech joint ventures already exist in China .

### **Biotechnology projects between China and the West**

- ❖ Joint venture Principal Product
- ❖ China Institute of Atomic Energy and ELISA test kits
- ❖ Biomedical Systems (Australia)
- ❖ Beijing Institute of Biological Products and Recombinant hepatitis B Vaccine
- ❖ Merck Sharp & Dohme (United States) (licensing agreement)
- ❖ Shanghai Center of Biotechnology and Hemoglobin blood substitute International Hematoglobin Technology Division (Canada)
- ❖ Ningbo Abbott Technology Biopharmaceuticals
- ❖ Sino-American Biotechnology Enzymes used in molecular (Promega Biotech and Louyang biology, monoclonal antibodies,
- ❖ Biochemical Pharmaceutical Factory) and DNA polymerase
- ❖ China National Green Food Corp. Bioinsecticides (signed letter of (part of Chinese Ministry of Agriculture) intent, 1993)

and Ecogen (United States)

- ❖ Institute of Microbiology (Academic Sinica) Licensed (not joint venture) and Hoffmann-La Roche (United States) two-step process for production Of Vitamin C
- ❖ Shanghai Institute of Plant Physiology and Joint research into soybean Monsanto Corp. (United States) protoplasts Amgen (United States) Neupogen undergoing clinical trials in China; Amgen plans to open representative offices in Shanghai and Beijing
- ❖ Poultry Association of China Joint venture currently being finalized to produce poultry biological and other animal health products
- ❖ China National Biological Products Corp. Diagnostic tests to be used in
- ❖ Epitope (United States) oral specimen collections samples.

#### **POINTS TO BE TAKEN CARE**

- ❖ Indian companies must ensure that their actions are not misunderstood by their Chinese counterparts.
- ❖ Agreements must be spelled out as clearly as possible because determining precisely which Chinese company or institution to deal with can be difficult. Because of intellectual property concerns,
- ❖ Indian companies should take special care to state clearly in the contract the state clearly in the contract the provisions for technology transfer to the Chinese company.
- ❖ The structure of the joint venture ownership is also important -- in both equity and contractual joint ventures -- as are choosing the best partner and geographic location.

With the continued financial and regulatory support of Chinese government, China's biotechnology sector is poised to grow with the rest of China's burgeoning economy. As China rapidly develops high-tech biotechnology products, it will rely heavily on the international biotechnology community to import materials in short supply, such as reagents; to gain technological and

management expertise; and to collaborate on research development. However, entering China's complex, rapidly changing, and profitable market require careful choice of the best strategy.

According to CII, time is of the essence in penetrating China's market. Indian biotechnology companies should enter China's market as soon as possible to best take advantage of China's exponential economic growth. Some major U.S. and European biotechnology companies have already signed agreements and negotiated joint ventures and research contracts with Chinese partners. Delayed entrance will be difficult and costly. The bottom line is that China is highly complex and profitable economy for biotech companies, and the best time to enter China is now.

## **Appendix:**

### **Chinese Foreign Investment Enterprises**

#### **Equity Joint Venture (EJV)**

A limited-liability corporation with joint investment in and operation by Chinese and foreign partners. Approval procedures are specified. *Profits and risks:* Corresponds to share of equity held by each partner.

*Investment contributions:* In cash or in kind, minimum foreign investment is 25 percent with no maximum specified (usual contribution is 50 percent)

*Effective tax rate:* Usually 33 percent.

*Exemptions:* Joint ventures of 10 years or more are exempt the first two profit-making years and receive a 50 percent reduction the next three profit-making years. Other reductions or preferential treatment may be offered because of location or type of project.

#### **Contractual Joint Venture (CJV)**

- 1) A limited-liability entity with legal-person status that closely resembles an EJV.
- 2) A business partnership without a joint management entity. Parties operate as

separate legal entities with respective contractual obligations

The same procedures must be followed for CJVs as for EJV's.

*Profits and risks:* Profit sharing is based on a ration specified by contract.

*Investment contributions:* Need not be in cash or in kind. Labor and utilities have been allowed as contributions. No minimum or maximum levels are required.

*Effective tax rate:* Limited-liability entities are taxed as EJV's. Partners with separate legal entities are taxed on profits received. Effective tax rates range from 30 to 50 percent.

### **Wholly Foreign-owned Enterprise (WFOE)**

A limited-liability entity solely owned and operated by a foreign investor.

*Approvals:* By application to the Minister of Foreign Economic Relations and Trade or its local counterpart detailing all aspects of the project. On approval, the foreign company has 30 days to submit the approval certificate to the State Administration of Industry and Commerce for a business license. Separate land, utilities, and labor contracts are drawn up with appropriate departments.

**Source: various websites**

### **India China – Hitech Show, October 16-19, 2003, Beijing**

China and India. Two of the world's fastest growing economies. The two largest consumer bases. One with two decades of reforms and economic restructuring, the other with one. Both brimming over with technically qualified personnel. Both opening up to promote private enterprise. Both investing heavily in infrastructure development and forever on the lookout for economically viable and sustainable partnerships in top-end technology sectors. Both redefining the global trade order. Both having much to offer each other in diverse sectors to complement their competencies.

The India-China Hi-tech Show is a unique initiative from CII, to bring together leading Indian and Chinese companies engaged in high technology businesses on a common platform.

The Show promises to provide never before opportunities for exploring and

building upon mutual synergies. There will be lessons to learn for organisations from both countries in terms of economies of scale, breakthrough research and world class services.

The India China Hitech Show will be extremely relevant for IT, Drugs & Pharmaceuticals and Biotech companies that are keen to boost their exports and would like the Chinese Companies to see and access their products and services.. Key objectives of this this show are :

- To project the latest developments in the Drugs and Pharmaceuticals.
- To provide platform to companies to generate business, meet buyers, conduct market research, promote technology etc. at untapped East Asia Market.
- To explore the possibilities of technology transfer, strategic partnership, investment collaboration and joint venture.

*For More information you can log on to [www.india-chinashow.org](http://www.india-chinashow.org).*

