



## Outsourcing in China and India: A Comparison

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The global pharmaceutical industry is facing a number of challenges. Companies today need to pursue more efficient, cost-effective and productive ways to conduct their operations, whether in R&D or manufacturing. The key to a quick turnaround is to have drugs discovered quicker, developed faster, manufactured cheaper and marketed more widely.

Outsourcing is one method that helps drug companies by providing them with the desired efficiency, flexibility and agility. Among the emerging countries, China and India have risen rapidly in the global pharmaceutical outsourcing arena, as both countries possess the unique combination of low cost and quality service. The current global financial crisis has also enhanced the importance of these two countries to many drug companies around the world that are seeking cost reductions.

China and India each possess their own unique features and characteristics, not only in the pharma-related industries but also in almost every aspect of the social structure. To many companies that are interested in conducting outsourcing or looking to invest in either of these countries, it is a challenge to decide on the one that best fits the company's investment goals.



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(Source: China Pharmaceutical Group)

### Compare and Contrast

An in-depth study was conducted for the comparison of pharma outsourcing service industries between China and India. This article summarizes the results in a number of areas. It reveals the similarities and differences between these two countries, their advantages and disadvantages in pharma outsourcing, and their strengths and weaknesses in service capabilities.

The investigation of the pharma outsourcing industries in both countries was conducted on the top 50 outsourcing service providers in each country. Detailed comparisons were made between these selected companies in more than ten different areas:

- Advantages and disadvantages of each country in pharma outsourcing;
- Strength and weakness of each country in traditional pharma industry;
- Strength and weakness of each country in biopharmaceutical industry;
- Each country's R&D capabilities in innovative medicines;
- Development history and pattern of pharma outsourcing industry in each country;
- Current market sizes and their shares in the global pharma outsourcing industry;
- Overall service capabilities of each country;
- Service features of each technical sector in each country;
- Cost structures;
- Global presence

China and India are similar in many aspects. Both are located in Asia and are among the most populated countries in the world. Both are still developing countries with low wages for most workers in many industries. The countries offer significant cost-reductions for drug R&D and manufacturing as compared with countries in the west. Both countries now have an acceptable Intellectual Property (IP) protection environment, which is the direct result of the government efforts in both countries.

However, there are also significant differences between these two countries pertaining to pharmaceutical industry.

Largely due to the difference in each country's history in general, the standard of English in Indian companies is better than that of their Chinese counterparts. The formers' business operation style and philosophy are closer to those of western countries.

Indian companies also tend to be more familiar with western regulations than Chinese companies. They also tend to have more extensive global operations. China however, is better equipped in terms of industry infrastructure. The Chinese pharmaceutical market is also much bigger than India's.

China's total pharmaceutical market was valued at about US\$68 billion in 2008. It was composed of three parts: western-style medicines that are chemically synthesized small molecule drugs; biologics drugs; and Traditional Chinese Medicine (TCM). In comparison, India's pharmaceutical market was worth about US\$14 billion. China's biotechnology industry is more advanced and its education standard in biology is of a higher level.

### **Strengths and Weaknesses**

In pharma outsourcing industry, the combined service scope in each country spans the entire value chain of drug R&D and manufacturing. However, neither country's CROs/CMOs are able to provide fully integrated services at present. There are also differences between the service sectors of these two countries.

In target identification and validation as well as their related areas such as genomics and proteomics research, Chinese companies possess stronger service capabilities than Indian companies. Among the top 50 players in each country, twenty Chinese companies offer good quality services in these areas; whereas only thirteen Indian companies possess similar capabilities.

In drug discovery which primarily includes medicinal chemistry research and heavily involves the generation of IPs, Chinese and Indian companies possess similar skills in rational drug design and optimization, and offer similar services and quality.

For preclinical research, Chinese CROs (Contract Research Organizations) provide better services than Indian CROs. There are 21 Chinese CROs that offer a variety of services in this area. Nine of them also have capabilities in in vivo efficacy testing for non-human primates. Although India has eighteen CROs, none of them offer the service of efficacy testing in nonhuman primates.

In clinical research, the situation is just the opposite. There are 20 Indian CROs that are qualified to enter the list, compared to only 12 Chinese companies. Moreover, four Indian CROs offer central lab services; whereas none of Chinese-run CROs currently possess the same service capabilities.

In process R&D and contract manufacturing, both countries possess similar capabilities. However, Indian companies have better skills and capabilities in formulation and the manufacturing of small molecule drugs.

Chinese companies are more capable than Indian companies in the large scale manufacture of macro compounds such as vaccines, antibodies, recombinant proteins, small interfering Ribonucleic Acid (siRNAs), etc. There are 15 Chinese companies that possess such capabilities; whereas only six Indian companies offer similar services.



### **Traditional Pharma Companies Involved in Outsourcing Service**

In the traditional pharma sector (generic drug manufacturing), there are more major Indian pharma companies that are involved in outsourcing service than Chinese companies. While there are 28 major Indian pharma companies that are qualified to be in the top 50 list, only 14 major Chinese pharma companies made it into the list. Many Indian pharma companies are actively seeking outsourcing opportunities in overseas markets, whereas their Chinese counterparts are more passive. In terms of global presence, 13 Chinese companies have products marketed in overseas markets compared to 30 Indian companies. Moreover, most Indian companies market their products in the well-regulated western markets and a higher proportion of their products are made up of dosage form medicines. In comparison, almost all Chinese pharma companies market their products mainly in less regulated markets, with the majority of these products being Active Pharmaceutical Ingredients (APIs).

### **Biotech Companies in Outsourcing**

Among the top 50 Chinese companies, eight of them are biotech companies, compared to six Indian companies. China has advantages over India in biotechnology in areas such as molecular biology, gene therapy and genomics and proteomics research. Chinese biotech companies have successfully developed a

variety of innovative biologics medicines. An example is the world's first cancer gene therapy drug, Gencidine, a recombinant human Ad/p53 injection.

The Chinese government has identified biotech as one of the high-priority industries in the country for future development. In its 12th Five-Year Development Plan, the Chinese government has outlined a series of detailed blueprints to guide its future development including the promise of greater investment.

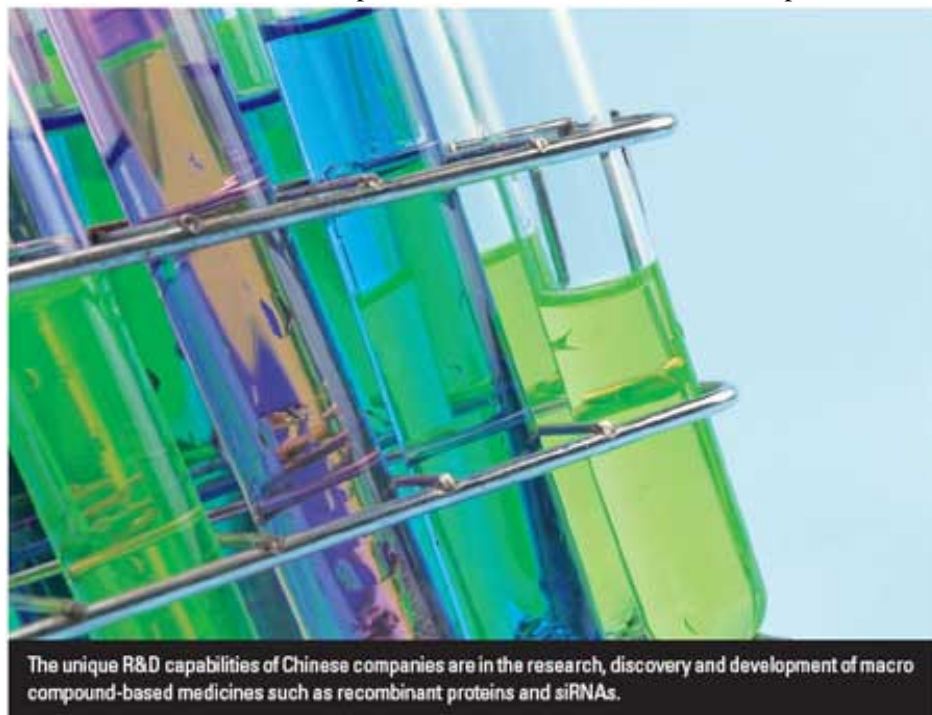
The biotech industry in India is still in an early development stage. However, the government also supports and promotes the development of this industry. For example, the Indian government plans to launch twenty biotech parks by 2010. At present, India has four biotech parks, mostly concentrated in Hyderabad and Gujarat. The country's central bank has also reduced its loan interest rates to allow small biotech firms to have better access to funds.

Among the top fifty players in each country, the number of Chinese and Indian companies that possess internal R&D programs are the same (twenty in each country). However, their research focuses and capabilities are different.

The R&D programs in many Indian companies focus on small molecule drugs. Generally, starting with well-validated therapeutic targets, their primary strategies are to conduct structural modifications on those known or approved drug molecules, hoping to improve the latter's activity profiles. At present, eight Indian companies in the list have drug candidates in late development stages.

Several major western pharma and biotech companies have in-licensed promising drug candidates from Indian companies. A couple of years ago for example, Novartis licensed an anti-diabetic drug (DRF 4158) from Dr Reddy's Lab.

A number of Indian companies including Dr Reddy's, Ranbaxy and Nicholas Piramal, have converted their R&D-divisions into independent, R&D-oriented biotech companies.



### **Domestic Marketing**

The R&D activities in Chinese companies are more diversified. In major Chinese pharma companies, a large portion of their on-going internal R&D efforts are focused on the development of generic drugs that are targeted at the domestic market. Only a handful of Chinese companies are conducting R&D programs that are similar to those of Indian companies. Examples include Jiangsu Hengrui Medicines and

Hutchison MediPharma. At present, full-scale R&D programs of small molecule medicines in most Chinese companies are still in the early stages. So far no drug candidates discovered and developed by the companies have been out-licensed to western pharma companies (although this is expected to happen in the near future).

The unique R&D capabilities of Chinese companies are in the research, discovery and development of macro compound-based medicines such as recombinant proteins and siRNAs. Examples include Shenyang Sunshine Pharma and Shanghai Sunway Biotech, both focusing on the R&D of proteins such as therapeutic tools.

The pharma outsourcing industries in both countries have grown rapidly in the recent few years. They are currently valued at about US\$1.42 billion for China and US\$1.77 billion in India, with both occupying only about a two percent share in the global outsourcing market - although both markets are poised for rapid growth in the future. However, China appears to have a higher future growth potential compared to India as it has fewer growth resistors. The former's outsourcing market is likely to catch up with and surpass India's after 2010.

### **Investment Strategies**

Major western pharma and biotech companies adopt different strategies in these two countries. In India, they tend to form close collaborations such as risk-sharing outsourcing with an Indian company to co-develop drug candidates - but few of them are willing to permanently set up larger R&D centers or manufacturing facilities in the country.

In contrast, a number of these major companies have invested several hundred million dollars in China to establish their wholly-owned R&D centers, large scale manufacturing and even marketing facilities. Many of these centers are now ready to conduct full-scale research independently.

At present the R&D centers belonging to major pharmaceutical companies are typically staffed by 300-500 researchers. For example, the Shanghai R&D centers of both GSK and Novartis have about 500 scientists. Pfizer's Shanghai center has about 350 scientists. Roche's R&D center in the same city has just over 200 employees.

The outsourcing models between western companies and Asian companies are also not limited to just R&D. They have also been extended to include various types of activities such as product marketing and drug candidate licensing.

Ortho-McNeil Jassen Pharmaceuticals (OMJPI), a subsidiary of Johnson & Johnson has (almost) simultaneously signed separate outsourcing deals with a Chinese company and an Indian company.

These two outsourcing collaborations indicate that western companies are increasingly utilizing CROs in emerging countries particularly in China and India as the extensions of the former's R&D divisions. This demonstrates the growing level of trust in such companies for drug R&D.

China and India have become the two most popular countries for outsourcing. However, each country possesses its own characteristics and offers unique services. It is important for outsourcing companies to understand these differences.

At present, India is more advanced in small molecule drug R&D and manufacturing. China has achieved stronger competencies in biotechnology including the R&D and in the manufacturing of macro compounds. India offers better product quality while China is able to provide a higher cost reduction.