中国创新药研发：现状与未来

Innovative Drug R&D in China

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Scope of the Report

As Chinese pharmaceutical industry is rapidly rising, a growing number of Chinese drug companies and organizations (including pharma and biotech companies, research institutions and even outsourcing service providers) pay attention to innovative drug R&D. Their attempts are also encouraged by Chinese government who promise to provide financial support and further fueled by the growing abundance of venture capitals that are gradually becoming readily available to Chinese companies. However, to a large extent, the innovative drug R&D activities in Chinese companies still remain a myth to many companies outside China, including the scope and scale of their research, current state of their research capability and development stage of their product pipelines, etc.

To reveal the real state of the innovative drug R&D in China, we conducted a broad and in-depth investigation on the innovative drug R&D activities in China. This report summarized our latest research results on this subject.

The report is composed of four chapters and supported with 53 tables, 18 figures and 12 case studies. Each chapter focuses on one area and provides detail and in-depth description and analysis.

Chapter One describes the overall situation of innovative drug R&D in China at present, including the composition of players, their current research capability, the funding sources of their R&D programs and the potential impacts of this Chinese industry on the global pharma industry.

Chapter Two analyzes in detail those players conducting innovative drug R&D, including their R&D experience, development stages of their product pipelines, their research strength and therapeutic focus.

In Chapter Three, an in-depth analysis of all drug candidates obtained during our investigation was presented, including their development stage, molecular structure, mechanism of action, distribution in each therapeutic area, etc.

The last chapter presents our in-depth analysis of the future development and growth of this Chinese industry, including the analysis of a series of growth drivers and the roles each of them will play in determining the future move of this Chinese industry, and the latest development of Chinese companies in other frontier pharmaceutical research.

The report is a must-read book to all those professionals and organizations that are interested in learning how the innovative drug R&D in China is currently going and will likely develop in the future.

About Author

Jim J. Zhang, Ph. D.

Jim J. Zhang currently is president and managing director of JZMed, Inc., a leading pharmaceutical outsourcing service provider that specializes in market research on Chinese pharmaceutical and biotechnology industries. Before founding the company, Jim worked for nine years with Albany Molecular Research, Inc. (AMRI), a US-based and currently one of the world largest CROs. During his tenure at AMRI Jim was responsible for managing and overseeing multiple drug R&D projects that involved the international cooperation of AMRI's multiple sites (USA, Singapore and Hungary). He played key roles in helping numerous pharma and biotech companies discover and develop a series of drug candidates that later entered preclinical and clinical development including advanced clinical trials. He was also the key contributor to the development of chemical production process for several developmental drugs. Prior to pursuing his Ph.D. program in the US, Jim worked for six years in a China-based CMO as process engineer and developed production process for a number of pharma products.

Jim's technical expertise spans from chemical process research and development to drug discovery and development for viral infection, cancer, chronic obstructive pulmonary disease (COPD) and cystic fibrosis. Currently he holds 18 patents. He is also the principal author of 12 peer-reviewed research articles.

Jim has authored a series of industry reports about Chinese pharmaceutical outsourcing. He was also invited by a number of market research firms such as Business Insights to author/co-author industry reports.

Jim received his master's degree in Chemical Engineering from East China University of Science & Technology (Shanghai), and his Ph.D. degree in Synthetic Organic Chemistry from the University of Iowa. He also received additional trainings in Medicinal Chemistry through working at Research Triangle Institute (Research Triangle Park, North Carolina).

Report Description

As Chinese pharmaceutical industry is rising rapidly, a growing number of Chinese drug companies pay attention to investing in research of innovative medicines. Their attempts are encouraged by government who promises to provide financial support and improve industrial infrastructure. Their programs are infused with increasing numbers of returnees. Their progress is also accelerated by the growing abundance of venture capitals.

Their efforts have now started yielding fruitful results. There have been a variety of drug candidates in various development stages in the product pipelines of these Chinese drug companies for a broad range of therapeutic targets. More significantly, driven by a number of positive factors, this sector of the Chinese pharmaceutical industry has gained an extraordinary growth momentum and will thus continue to develop in the future.

However, to a large extent, it is still a myth to many companies/organizations outside China about the R&D activities in these Chinese drug companies and the progress of their programs.

The report "**Innovative Drug R&D in China**" is designed to reveal the real state of the innovative drug R&D in China including their research scope and scale, their current focus and capability in innovative drug R&D and the development stage of their product pipelines.

Based on a broad and in-depth investigation, the report provides a clear insight into the current situation of the innovative drug R&D in China. It also provides the in-depth analysis of the future growth potential and drivers of this Chinese industry.

The report is a must-read book to global pharmaceutical and biotech companies that are seeking research collaborations with Chinese companies, venture capital investors interested in investment opportunities in Chinese pharmaceutical and biotech industries, market research/consultancy companies seeking the information of the development situation of China's drug R&D, and even the government agencies of those countries that are interested in learning the current and future development of China's biotech industry.

Key Findings of the Report

- Largely due to the short history of its modern pharmaceutical industry, innovative drug R&D in China is just beginning, but it has truly taken off. The sustained fast growth of China's economy has made the innovative drug research affordable to the country.

- At present there are three groups of companies playing key roles in this Chinese industry. The first group contains those top tier pharma companies. However, within this group of companies only a small fraction of them are conducting truly innovative drug R&D. The second group is composed of those young, R&D-oriented biotech companies. The majority of them are founded by returnees who received higher education in the West and further gained direct experience during their prolonged stay in the Western pharma or biotech industry. This is currently the main force of China's innovative drug R&D. The third group includes those top tier state-owned research institutions including those research universities that have life science schools/departments.

- Interestingly, a small number of China-based outsourcing service providers (mainly those top tier CROs) are also conducting innovative drug R&D internally. On the other hand, the number of state-owned research institutes focusing on the innovative drug R&D is actually small. Our study revealed that it was only a perception that the top tier research institutions are the main force of the innovative drug R&D in China. In fact, the majority of these research institutions are primarily focusing on the basic type of medical research.

- The growing funding sources that now become more readily available to Chinese companies are the key driving force for their innovative drug R&D programs. Combined together, these companies support their R&D programs through four major funding sources: venture capitals, public offering (or IPO), government grants and self-funded (through either selling products or providing outsourcing services). The availability of government grants from both central and local provincial or municipal government is increasing. Opportunities of venture capital investment are also rapidly growing. Meanwhile, the exit channels for venture capital investment also gradually become mature.

- The current strengths of Chinese companies in research of innovative medicines almost equally reside in both small molecule and macro compound-based drugs. Their research approaches for small molecule drugs primarily focus on the structural modifications of natural products that are derived from the medicinal herbs of traditional Chinese medicines (TCMs). Their research methodologies for novel biologic drugs are, however, more diverse and advanced, including all types of biologically derived proteins.

- Nearly 65% of drug candidates are in early development stages (either preclinical or phase I clinical trials), an indication that the innovative drug R&D in China is just beginning. However, a decent number of novel medicines such as TCMs, gene therapy drugs and a variety of vaccines have proceeded to the advanced development stages. Some of them have been approved for marketing.

- Of all these Chinese drug R&D companies, about 45% of them either have programs for development of anti-cancer agents or entirely focus on the novel cancer drug development as their sole therapeutic area. Cancer drugs based on a variety of treatment mechanisms are also the largest group of drug candidates in their product pipelines. The situation is well in line with the current development state of the global drug R&D.

- The formation of a positive environment of innovative drug R&D in China also fosters the growing research activities in other pharmaceutical research areas such as the development of new drug delivery technologies, novel molecular diagnostic and imaging tools, biomarkers and frontier research such as stem cell and RNA interference. New technologies and products in these areas also start emerging.

- Largely attracted by the growth potential of China's pharmaceutical market and the advantage of a large talent pool coupled with the still low labor cost, growing numbers of pharma and biotech companies from around the world are conducting innovative drug R&D in China or collaborating with local Chinese drug companies.

- However, the R&D collaborations between the major Chinese pharma companies and the R&D-oriented Chinese biotech companies are very rare. Unlike in the Western pharma industry, those major Chinese pharma companies do not rely on the emerging Chinese biotech companies to fill out their product pipelines. In fact, many of them do not have an established product pipeline filled with innovative medicines yet.

- Because of the short history in innovative drug R&D, there are a number of limitations associated with this Chinese industry primarily in such areas as the research skills and experience.

- On the other hand, driven by a number of factors, this sector of the Chinese pharma industry has gained an extraordinary growth momentum. The main growth driver is the determination of Chinese government to transform the Chinese pharmaceutical industry from a generic drug-focused industry to an innovation-driven drug development powerhouse.

Key Features of the Report

- The report is the first time ever in the history of pharmaceutical industry that describes in depth the most mysterious part of the Chinese pharmaceutical industry.
- The report depicted a whole picture of the innovative drug R&D in China at present. It revealed the real development state of this Chinese industry.
- The report also conducted in-depth analysis on the future development of this Chinese industry including all drivers and the roles each of them will play in steering this Chinese industry.
- The report contains forty (40) Chinese drug companies that have the most advanced programs in innovative drug research. It analyzed in depth the research focus and capability and the product pipelines for each of these companies.
- The report also contains 110 drug candidates in various stages of preclinical and/or clinical development in the product pipelines of these Chinese companies. It described in detail the features of their molecular structure, the mechanism of their action and the current stage of their development.
- The report is composed of four chapters (a total of 230 pages) and supported with 53 tables, 18 figures and 12 case studies. Each chapter focuses on one area and provides detailed and in-depth description and analysis.
- The report also contains a detailed company profile for each of these forty companies studied in the report.
- The report is currently the sole source of its kind available on market to all types of companies and organizations that are interested in learning the development state of China's innovative drug R&D.

Your Questions Are Answered

The report provides complete and detail answers to a variety of questions such as:

- What is the current state of China's R&D on innovative medicines? How many companies are conducting innovative drug R&D in China?
- Who are the major players in China's innovative drug R&D? How are their current R&D capabilities?
- What is the main driver encouraging Chinese companies to conduct research on innovative medicines?
- What are the major funding sources for innovative drug R&D programs in Chinese companies? To what extent are the Western VCs involved?
- What are the feasible exit strategies in China? Did they work? Which one is most popular at present?
- What is the development state of the product pipelines of these Chinese drug companies?
- What are the most active therapeutic areas currently pursued by Chinese companies? How do the drug candidates distribute in development stages of each therapeutic area?
- What are the strengths and weakness of Chinese companies in innovative drug R&D?
- What are the current state and capability of Chinese companies in the frontier pharmaceutical research areas?
- How about the research collaborations between domestic Chinese companies and between Chinese companies and experienced international pharma or biotech companies?
- What is the future prospect of China's innovative drug R&D? What are the main drivers of its future development?
- Are there any Western companies that are interested in licensing drug candidates developed by Chinese companies?