

The Appraisal and Countermeasure Analysis of the Export Competitiveness of biopharmaceutical Industry in China

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Abstract: *In recent years, the China's biopharmaceutical industry has developed rapidly, accounting for a larger and larger proportion in the world's biopharmaceutical market. However, China's biopharmaceutical industry started later than developed countries, which is far behind developed countries. The international market share of American, European and Japanese enterprises has reached 59%, 19% and 17% respectively, while that of China and other countries is less than 5%. Therefore, China must improve the international competitiveness of the biopharmaceutical industry. In this paper, using the theory of international competitiveness as the foundation, from the drug quality, professional talents, knowledge, skills, money, and related infrastructure, government policy, etc., studies the influence factors of affect the biological medicine industry in China and puts forward some corresponding suggestions and countermeasures, in order to improve the production's international competitive advantage in China.*

Keywords: *Biopharmaceutical production, International competitiveness, influence factors*

At present, the global biopharmaceutical market is in a period of steady growth, with the market scale increasing from 149.9 billion in 2011 to 313.1 billion in 2020[1], China's biopharmaceutical market is about 56 billion[2]. Although the income of biomedical enterprises has increased greatly, their profits are far lower than those in developed countries. For domestic biomedical enterprises, the key point is that we must have the ability of innovation and sufficient capital investment. As an important part of strategic emerging industry, biomedical industry continues to develop, and the importance of biomedical products continues to be reflected from all aspects. As a high-tech industry, biomedical industry started late in China. There is a large gap between China's biomedical industry and developed countries, and its development has great challenges. It is of great significance to improve the international competitiveness of biomedical products.

1. Development status of Pharmaceutical products trade

In 2014, China's imports and exports of biomedical products reached 7.7 billion, exports were 2.78 billion and imports 4.92 billion, resulting in a trade deficit of 2.14 billion[3]. In 2017, China's total import and export trade of pharmaceutical products reached 116.68 billion, a year-on-year increase of 12.6%; The import volume was 55.88 billion, a year-on-year increase of 16.3%; The export volume reached US \$60.8 billion, a year-on-year increase of 9.4%, reaching the highest value in recent five years. The foreign trade surplus was 4.92 billion, a year-on-year decrease of 34.6%. In recent years [4], the export amount has increased and the biomedical industry has developed. However, most of the biomedical products exported by China are low value-added products, which are less competitive in the international market. For example, some blood products, glands and organs and some low-level vaccines, but China's biomedical products also have their own development potential, among them, there is China's own and innovative product - recombinant human insulin, This is the medicine that diabetics need, this is our country has the independent "gene recombinant human insulin" intellectual property rights medicine. In 2018, China's exports of insulin and its derivatives were about 334 million, and the exporting countries were Denmark, Australia, Pakistan, Indonesia, North Korea, Iran and other countries [5].

2. Analysis on Influencing Factors of China's Pharmaceutical Products Trade Competitiveness

The biomedical industry has the characteristics of high investment, high technology, high risk and

long cycle, so talents are an important factor for the sustainable development of this industry. Most of China's exports are primary processed biomedical products with low added value. Foreign enterprises import low added value products and sell high added value products back to the domestic market after processing. The biomedical industry is a high-tech industry, so engaging in this industry requires professionals, R&D and innovation to improve the added value of products. With the expansion of biopharmaceutical production base, including the transfer of production base to China by multinational pharmaceutical companies and the emergence of Chinese biopharmaceutical companies, the demand for talents becomes more and more urgent.

However, due to economic globalization and high talent mobility, the knowledge and skills of professionals in China's biomedical industry do not lag behind those in developed countries, but there are still many talents who will go to developed countries, which makes the development of domestic biomedical industry relatively slow. At the same time, the management of Biomedical enterprises is also relatively backward, and most biomedical enterprises cannot provide clear promotion space for talents. The talent stickiness of domestic enterprises is weak, and we often rarely find comprehensive talents who have both professional knowledge and international vision and understand the market demand.

Secondly, another important factor restricting the development and industrialization of biomedical technology in China is the lack of funds, which leads to the fact that most of the drugs produced and developed in China are generic drugs from developed countries; the capital investment of China's biomedical industry mainly depends on the self owned funds of the government and enterprises. Generally, the government investment can only meet the preliminary expenses of technology development. According to the research cycle of biomedical drugs, from technology development, mid-term testing to mass production, the investment proportion of each stage is about 1:10:100. Compared with general industries, the investment of biomedical industry is much higher than that of other industries. In 2016, the average R & D expenditure of China's listed biomedical companies was 14.07million, 65% of listed biomedical companies have R&D investment intensity less than 5%. Roche topped the list of the top 15 pharmaceutical companies in global R & D investment in 2016 released by endpoints news, with R&D investment of 11.41 billion, It is 3.4 times of the total R & D expenses of all A-share listed biomedical enterprises in China. Compared with countries with strong competitiveness in the pharmaceutical industry, there is still a large gap.

Third, 70% of the global biotechnology enterprises are concentrated in the United States and Europe, accounting for 95% of the global biotechnology sales, and the sales in the Asia Pacific region account for only about 3% of the global sales. As the leader of the biomedical industry, the United States accounts for more than 70% of the global market sales. Large multinational corporations dominate the global patented drug market, and their share in the global pharmaceutical market has increased. The concentration of modern pharmaceutical industry is increasing, and the monopoly level of multinational corporations is increasing year by year. There are a large number of domestic biomedical enterprises and listed biomedical manufacturing enterprises, but generally speaking, small and medium-sized enterprises account in China. There is a big gap between Chinese enterprises and world-famous enterprises. In the biomedical industry, the main way to obtain a lot of profits is to develop new products and obtain patents, but the development of new drugs requires a lot of capital investment and high risks, this makes fewer enterprises in China who have the research conditions and are willing to invest in research and development. When formulating strategies, the vast majority of enterprises change the process and dosage form of drugs for generic drugs, which curbs the creativity of the industry. The products produced by enterprises are similar. In China, they only rely on horizontal competition to promote the development of biomedical industry.

3. Countermeasures to Improve the Competitiveness of China's Pharmaceutical Products Trade

First, cultivate and reserve biomedical compound talents. At the macro level, China has always adhered to the strategy of "strengthening the country with talents". Research institutions and universities all over the country send a large number of biomedical professionals to the society every year, but there is still a "talent deficit" in China. Some top Chinese scientists choose to stay abroad because they do not have high-quality conditions at home. We should introduce policies Increase investment and introduce high-end equipment to retain top talents and make them willing to return home for development. At the same time, most biological research institutes in China are dominated by scholar talents. Some vocational education contents on talents should be added to make some talents transform from scholar type to compound type. The research field can also be expanded to application

field and promote the innovation of biomedical products, At the micro level, in addition to the preferential policies issued by the government, it is more important for biomedical enterprises to improve talent management measures and establish incentive mechanisms. For biomedical talents, the current development direction is the promotion path in research institutions. Therefore, biomedical enterprises should provide training mechanisms and clear promotion path direction for researchers working in enterprises, In order to excavate, cultivate and encourage researchers to innovate products, or make them become management personnel with professional knowledge, so that enterprises can obtain the required compound talents to promote the development of enterprises.

Secondly, increase investment in R&D. For enterprises with insufficient funds, on the one hand, relevant policy financial institutions can be established to increase the amount of bank loans to biomedical enterprises and reduce the difficulty of bank loans. This measure can enable biomedical enterprises to increase R&D investment through their own funds. On the other hand, most of China's biomedical Enterprises are compound pharmaceutical enterprises with biomedical departments, Therefore, they are unable to allocate a large amount of funds for research investment like the specialized biomedical enterprises in developed countries, but the state can set up specialized biotechnology research institutions. At present, China's support for biomedical projects only lies in the financial support for applied research projects. The amount of funds scattered into various projects is not enough, but the establishment of specialized technical research departments, Centralized allocation is more conducive to increase the effective utilization of funds, and the funds will not be too scattered to slow the research process, or when the research progresses to the primary stage, the funds are insufficient and the research cannot continue.

Finally, China can follow the example of the United States and establish a biotechnology research center. Unlike ordinary research institutes, the biotechnology research center can carry out cross research with other disciplines and pay more attention to application fields. The biotechnology research center can focus on breaking through a number of key technologies, such as R&D and production technology of therapeutic antibodies, R & D and production technology of new vaccines, Stem cell therapy related technologies and nucleic acid drug delivery and sustained-release technologies, so that the innovation and development of biomedical products will gradually keep up with developed countries.

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