

# The transformation and innovation development of biopharmaceutical industry under the background of aging

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**Abstract.** With the acceleration of population aging process, the elderly industry has been paid more attention. It will effectively promote transformation and innovation development of the third industry, especially the biopharmaceutical industry. From now to 2030, the aging will develop rapidly. The change of population aging would be adapted only by speeding up the transformation of economic structure and the construction of the pharmaceutical industry. Consequently, biopharmaceutical industry, which is one of the strategic emerging industries should find a new way to adapt to its new opportunities and challenges. In this study, the strategic position, emphasis and difficulty of transformation and innovation development of biopharmaceutical industry under the background of the rapid aging was summarized and a feasible strategy measure was proposed.

## 1. Introduction

With the rapid development of economy, the development of science and technology and continuous improvement of people's living standard, the aging has become the focus of the world. The consumption proportion of health care, medical services and nursing care of old people has increased because of the aging. The development of health care and pharmaceutical industry should be higher required accordingly. In addition, the coordinated development of a healthy aging society should be promoted by accelerating the development of pharmaceutical industry, especially the biopharmaceutical industry [1]. In this study, the countermeasures of transformation and innovation development of biopharmaceutical industry under the background of aging were summarized.

## 2. The general situation of biopharmaceutical industry

Biopharmaceutical industry is the interdisciplinary field of biotechnology and pharmaceutical industry. It is an important competitive battlefield of world pharmaceutical giants. Compared with traditional drugs, biotechnology drugs have curative effect and social benefits. Their market demands grow with each passing day, because of their important therapeutic effects on major diseases threatening human health. In the 21st century, biopharmaceutical industry is still a sunrise industry. The rapid development of biopharmaceutical industry is the trend of development of pharmaceutical industry in the future [2,3].

## 3. The opportunities and challenges of transformation and innovation development of biopharmaceutical industry under the background of aging

The standard of World Population Organization is that in a region, if 60 years old people accounted for 10% of the total population, or 65 years old people accounted for 7% of the total population, this region has entered the aging society. At present, China has officially entered the aging society. <The prediction research report of development trend of Chinese aging> pointed out that compared with other countries, Chinese aging has the characteristics of the huge scale of the elderly population, rapid development of aging, more elderly women and aging ahead of economic modernization [4].

Under this background, the aging trend could have an enormous impact on medical expenditure. It is urgent to promote the transformation and development of pharmaceutical industry.

Biopharmaceutical industry is a sunrise industry that will never decline. After nearly 20 years of development, the research, development and industrialization of biological drugs in our country has a considerable size. However, it was started late in our country and was still in a relatively backward state that compared with developed country. The main factors which restrict the development of Chinese biopharmaceutical industry are as follows: the shortage of funds, weakness of reaserch and develop, lack of industrialization mechanism and low transformation rate of scientific research results [5,6].

With the development of biotechnology and the diversification of drug consumption structure of aging, biopharmaceutical industry is facing tremendous pressure and challenge in our country. It is mainly embodied with much imitation and less innovation and much raw materials' production and less dosage form's preparation [7]. Furthermore, there are also problems of lack of leaders in technology management, weakness on the open mind of industry development and so on. In order to promote the comprehensive strength of biopharmaceutical industry, a suitable innovation and development mods should be used in its transformation and upgrading.

#### **4. The strategic measures of transformation and innovation development of biopharmaceutical industry under the background of aging**

With the development of biotechnology, the diversification of drug consumption structure of aging and the improvement of drug safety requirements, the dominance of chemical drugs in the market was unprecedentedly challenged. Moreover, many social problems were caused by high energy consumption, high material consumption, high pollution and other factors of traditional pharmaceutical industry. Accordingly, to transform chemical raw materials and focus on the development of biopharmaceutical industry, to optimize the structure of biopharmaceutical industry, to establish a green emerging industry of sustainable development are the primary tasks of the development of biopharmaceutical industry.

##### **4.1 Complete "two transformations"**

*4.1.1 The transformation from counterfeit drugs to innovative drugs.* At present, industrial production is in the majority of biopharmaceutical industry in our country. Most pharmaceutical enterprises have a relatively high proportion on counterfeit drugs, and low on innovative drugs. They Rely on low cost and low price competition and lack of the capability and motivation of research and development. So, it is a good method that through the increasement of the investment of independent research and development project in biopharmaceutical industry and the purchase of technology transfer results, the original drugs and new drugs with independent intellectual property rights could be developed and innovated [8]. The process of industrialization of innovative drugs should be accelerated. In addition, a number of major new drugs could be in clinical research and put into the market.

*4.1.2 The transformation from Active Pharmaceutical Ingredient production to the research on dosage forms.* On the basis of the advantages of traditional Active Pharmaceutical Ingredient, biopharmaceutical industry should be focused on the extension of upstream biotechnology and genetic engineering, the improvement of technical equipment level and the development of the new biopharmaceutical formulation at the condition of friendly environment. Furthermore, the new biopharmaceutical formulation and the delivery systems of sustained - release, controlled release, targeted, transdermal, mucosal, and carrier should be developed. The industrialization of microspheres, liposomes and other drugs should be realized. The bioavailability and compliance of patients should be improved. Accordingly, some pharmaceutical preparations could go into the international market.

## 4.2 Carry out "three innovation"

The substance of industrial transformation is innovation. As for the biopharmaceutical industry, innovation is not only technological innovation, but also includes platform innovation and mechanism innovation.

*4.2.1 Technological innovation.* Technological innovation includes the core technology innovation in the superiority field and major technological innovation in the application field and frontier field [9]. Technological innovation determines the success of the transformation and development of biopharmaceutical industry. It could not only build a technology platform for the advancement of biotechnology and promote the transformation of the development of biopharmaceutical industry, but also take huge, potential economic and social benefits. In addition, in order to have the core competitiveness, the new drugs with market prospect and advanced technology should be developed. With the innovation of pharmaceutical enterprises and the elimination of outmoded production capacity, the technological innovation capability of enterprises could be improved.

*4.2.2 Platform innovation.* The innovation of the key biopharmaceutical industry base and other platforms should be strengthened and the technical talents and innovation funds of biopharmaceutical industry should be introduced. Moreover, the four service platforms including the platform of talent attraction, the platform of public technical service, the platform of investment and finance and the platform of innovative service management should be established and upgraded with government guidance, social participation and other methods so that biopharmaceutical industry could develop rapidly.

*4.2.3 Mechanism innovation.* With a good policy environment, the open mind, the positive attitude and good cooperation, the perfect financing system and incentive mechanism of talent introduction should be established and the reform of the system should be deepened so that the biopharmaceutical industry could innovate and develop.

## 4.3 Accelerate "three promotion"

*4.3.1 The promotion of technology.* The basic technology should be vigorously promoted with their own scientific and technology. Furthermore, according to the development of biopharmaceutical industry in our country, foreign advanced technology should be introduced and applied in the innovation and promotion of our technology. The cooperation of industry, university and research is an effective method to improve the success rate of technical promotion.

*4.3.2 The promotion of funding support.* The transformation of scientific and technological achievements directly determines the contribution to economic development. However, at present, the bottleneck of further development of our biopharmaceutical industry is the serious shortage of capital investment and relative weakness of pilot link [10]. Without the sufficient funds, the conversion rate of the achievements in biomedical research is not high and the level of industrialization is far behind the developed countries. Under the condition of the enhancement of brand effect and huge returns, the innovation and development of biopharmaceutical industry should be supported by a series of policies. Consequently, drug discovery would become an important source of economic growth.

*4.3.3 The promotion of talent quality.* The qualified personnel who knows both management and technology is deficient in our country. It is a crucial factor that restricts the development of biopharmaceutical industry. So the talent quality should be promoted to promote the sustainable development of the whole biopharmaceutical industry.

## 5. Conclusions

At this stage, China faces huge challenges of aging crisis. The rapid aging could promote a rapid growth in the demand for medical consumption. Under this background, it is necessary to complete "two transformations", carry out "three innovation", accelerate "three upgrade", focus on the development of biopharmaceutical industry and then make it a new pillar to promote economic growth. The medical pain in elderly patients could be reduced, the medication compliance could be

improved and then the medical economic pressure of elderly patients could be alleviated by the transformation and innovation development of biopharmaceutical industry.

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