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The Impact of the Discovery of DNA Double Helix Had

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Abstract: *The discovery of DNA double helix by Watson and Crick in 1953 caused a great sensation. Nearly 70 years have passed since then, and DNA double helix still plays an important role in the fields of medicine, agriculture and industry. In fact, the discovery of DNA double helix is not only these substantive contributions, but also gives us enlightenment that cannot be ignored in the fields of innovative thinking, talent attention, interdisciplinary innovation, etc. We should pay attention to the creation of "little people", be good at integrated innovation, interdisciplinary innovation, and continue to explore more unknown mysteries.*

Keywords: *DNA double helix, medicine, agriculture, innovative thinking, talent emphasis*

1. Introduction

1.1 Attention should be paid to the creation of "little people"

They were particularly young when the DNA double helix was discovered in March 1953. American biologist James Watson was 25 and British physicist Francis Crick was 37. It only took less than two years for them to come up with the double helix structure of DNA. The DNA double helix structure, together with quantum mechanics and relativity, is regarded as the three major discoveries in the field of natural science in the 20th century. It has pushed the field of biological science research from the cellular level to the molecular level. [1]

1.2 We should be good at integrated innovation

"Everything they haven't done is something someone else has done." That's what many wondered after Watson and Crick won the 1962 Nobel Prize for the DNA double helix. Some even suggested that this year's scientific prize had in fact omitted another important figure and brainchild of the discovery of the DNA double helix, British scientist Rosalind Franklin. It was Franklin and Wilkins who first took X-ray diffraction images of DNA before Crick and Watson modeled the double helix structure. [2]

Always think "creative" in your scientific work. Only "innovation" can promote the development of science; Only "innovation", can promote the progress of society; Only by "innovation" can the economy grow rapidly. [3]

1.3 Innovation needs to be multidisciplinary

Watson originally studied bird classification, while Crick was a physicist who didn't understand genetics. In the 1940s, Franklin, Wilkins, and Pauling, who studied the structure of DNA, were either physicists or chemists, so some people say that physics "took the lead" in giving birth to modern biology.

1.4 The revolution is not yet successful, comrades still need to work hard

People's understanding of the nature of life has only just begun. The structure of DNA itself, for example, has been found not to exist in the familiar rigid double helix, but in a very complex dynamic structure. For example, although it has been possible to sequence the 3 billion base pairs of the human genome, the mechanism of mutation of the SARS virus, which is much smaller than the human genome, is still not clear. In the face of nature, man is small. Man should always be in awe of the immensity of

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nature, but there is no limit to his ability to perceive it. As long as there are men in the world, our exploration and use of nature will go on forever. We firmly believe that the light of human reason will always drive out the darkness and bring about a better tomorrow for our society.

2. The Gospel for all walks of life in the world

2.1 The spring back of medicine [4]

2.1.1 Genetically engineered drugs

The discovery of DNA double helix structure model leads to biotechnology with genetic engineering as the core.

The human brain hormone somatostatin was first produced by American scientists using E. coli bacteria in 1977. This wasthe first success of genetic engineering research that caused worldwide shock and could further elucidate the theoretical basis of gene expression in higher organisms. The huge economic value is also tantalising. [5]

In 1979, American scientists announced the first expression of human growth hormone by genetic engineering. The hormone is highly specific and expensive, but genetically engineered human growth hormone is cheap and practical.

2.1.2 Gene Therapy

No matter it is genetic disease, cardiovascular disease, immune system disease, malignant tumor or infectious disease, it is related to gene mutation, deletion and abnormal expression, which requires to create a normal "good gene" to replace those abnormal "bad genes", or find a way to shut down those out of control genes, which is called gene therapy. [6]

Gene therapy has shown broad prospects in the treatment of a variety of related diseases for which there is no ideal treatment, and will become one of the routine treatment methods in clinical medicine in the future.

2.1.3 Plants and animals are used as bioreactors to produce valuable drugs [7]

Using transgenic plants as bioreactors can produce drugs, vaccines and industrial raw materials, which is a new trend of genetic engineering application in agriculture in the 21st century. The use of genetically modified plants to produce drugs, vaccines, nutrition can improve human health, production of industrial raw materials can improve the ecological environment.

At the same time, the cost of using plants as bioreactors is low, and the high purification process can be omitted, and the multi-valent vaccine can be made. It is suitable for children to take orally, without any side effects or danger. [8]

The toughness of the genetically modified plant could be used as a factory to produce plastic, which is not only biodegradable, but also has a wide range of commercial uses.

2.1.4 The Human Genome Project

When a person has no symptoms, it will prevent the disease by DNA testing in advance. At the same time as the "human gene sequencing" project, scientists are also working on the human functional genome research, which is an in-depth study of human genes, which will have a more profound impact on human health care. [9]

The biochip technology that has emerged in recent years will develop into a huge industry in the fields of human health protection, environmental protection, food, agriculture, and other life science research. It can be clearly seen that the introduction of the DNA double helix structure model will bring a revolutionary change to medicine.

2.2 Auspiciousness of agronomy [10]

Transgenic technology will have great application potential in crop variety improvement. At present, the research of transgenic technology in the improvement of plant varieties includes the following aspects: the transgenic plants with herbicide resistance, antiviral resistance, insect resistance, bacterial resistance and fungal resistance have been developed into field tests, and some have been popularized; Studies on transgenic plants resistant to salt, alkali, cold, drought and waterlogging have achieved

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initial results, and some have been put into field tests; Some transgenic plants have been successful in studying the content and quality improvement of protein, fat and starch in crops, and some have entered field trials. Transgenic tomatoes that delay ripening, can withstand storage and keep fresh have been commercialized. Transgenic cotton, which can change the color of fiber, has been studied successfully. [11]

According to the relevant estimates of the relevant departments of the United Nations, the adoption of biotechnology with genetic engineering as the core can make half of the hungry people in the world will get enough food by 2015, and the food yield can be increased by 10 -20.

The use of genetically modified seeds to control insects, the use of genetically modified seeds, the inclusion of genetically modified ingredients in almost all agricultural products and so on can reduce the cost of farm production, increase yields and reduce soil erosion. There are 25 genetically modified agricultural products on the market, including corn, cotton, peanuts, rapeseed, rice, soybeans, sunflowers, tomatoes and wheat. Nearly 30 more GM crops are expected to hit the market in the next six years. Biotechnology with genetic engineering at its core will bring about a new green revolution in agriculture.

2.3 Thriving industry

Taking the chemical industry as an example, the traditional chemical industry process is almost carried out under high temperature and high pressure, which is a typical energy consuming process. The use of transgenic technology in the chemical industry can not only save energy, but also avoid environmental pollution.

Using genetic engineering to construct engineering bacteria can purify waste water, waste materials and residues discharged from factories, which can improve the environment on the one hand, and obtain single-cell proteins for food and feed on the other hand. [12]

The use of genetic engineering can also bring new opportunities to ease the energy crisis. The Earth will eventually run out of fossil fuels and be replaced by bioenergy. Microbial fermentation produces sprinkles.

Scientists are also working on genetically engineered super-engineered bacteria that can break down cellulose and lignin to produce alcohol from straw, wood chips, plant residues and food scraps.

3. The impact on our country

3.1 The development of bioengineering in our country

China is a developing country, because of the shortage offund and talented person, there is still a big gap between the development level of bioengineering in our country and that of the developed countries, but due to the attention of the party and government, and due to the favorable environment given by the reform and open policy, the research and development of bioengineering in our country also presents a Lianbian situation.

In my country, a complete category of biological engineering research system has been established, forming a science and technology team of tens of thousands of people with young and middle-aged as the main body. The state has provided better financial support for bioengineering through the key research program, the 863 High Technology Program, the Natural Science Foundation and other relevant departments, and has made a number of achievements of great significance to the national economic and social development.

3.2 Promote the high quality development of economy

In our country, there have been more than 20 genetically engineered drugs successfully developed for the treatment of difficult diseases (such as viral diseases, cancer, cardiovascular diseases, immune system diseases, genetic diseases, vaccines for disease prevention, etc.). The top 10 sales of biotechnology drugs in the world, our country has been able to produce 8 kinds, sales from 1996 220 million yuan to 2000 2 billion yuan, an annual growth rate of up to 80, which is a new growth point of Chinese medicine economy.

More than 95 genetically modified organisms (Gmos) are being studied in China, involving more

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than 200 gene types. By the first half of 2001, the Agricultural Biosafety Committee of the Ministry of Agriculture had approved 22 genetically modified plants for release into the field environment, including rice, corn, cotton, soybean, potato and wheat. The traits of genetically modified plants include resistance to disease, insects, herbicides and quality improvement. Cotton, tomato, bell pepper and petunia are among the plants approved for commercial production. Insect-resistant cotton flower is the only genetically modified crop with China's independent intellectual property rights and widespread application. In 2002, the planting area of domestic insect-resistant cotton reached 9.5×10 hectares, and the cumulative economic benefits have exceeded 4 billion yuan. [13]

4. Summary

To sum up, the discovery of the DNA double helix has led the research resources of life science to focus on some fundamental questions about the phenomena of life. It transformed the research mode of life science and brought about the impact on the whole science, technology and society.

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