

# Opportunities and challenges of competitive sports in nano Era

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**Abstract :** Nanotechnology is a technology with high requirements of science and technology and involves many comprehensive disciplines. With the continuous development of science and technology, nanotechnology has penetrated into all aspects of our lives. Now nanomaterials, nanopumps, Nano Electronics and nanotechnology have been applied in the competitive field of China. It is these nanotechnologies that have made great progress in the field of sports competition in China. Looking to the future, we have to pay attention to the physical and mental health of athletes in the era of sports competition. At the same time, we should be good at using nanotechnology to promote the healthy and harmonious development of sports competition in China.

## 1 Nano concept and characteristics

As early as the late 1950s, the famous American physicists once predicted that if we can control and process atoms, then our science will take a big step forward and realize great changes in science. In the 1980s, the emergence of nanotechnology, as if to verify the physicist's prediction, nanotechnology has a profound impact on the world. After decades of development, nanotechnology has not only been applied in the field of physics, but also penetrated into all aspects of life and into various comprehensive disciplines. Nanotechnology has also had a huge impact on our competitive sports. In the face of this vigorous development of advanced science and technology, the field of sports competition has obtained great opportunities, but also faces challenges. How to use nanotechnology in sports competition? What changes will nanotechnology bring to sports competition? Will nanotechnology have a negative impact on local taboo? However, in the long run, the advantages of nanotechnology outweigh the disadvantages. Many sports professionals and scientific and technological workers still recommend the application of nanotechnology in sports competition, and as an important strategy, it has attracted the majority of workers' attention.

In essence, nanometer is a measure of length. Nanometers can calculate very small atomic diameters. A nanometer can be regarded as the diameter length of ten H atoms connected. Compared with the familiar unit of meter length, one billionth of a meter is equal to one nanometer. It is conceivable that this unit of measurement can not be observed with the naked eye, it exists in the micro world. Nanotechnology is a kind of technology that uses the knowledge of various disciplines and the nature of interdisciplinary to manipulate the micro so as to obtain the materials or materials we need. Nanotechnology mainly studies three directions, including nanomaterials,

nanoscale and nanodevices. There will be a scientific progress in each era, which will lead to changes in this era. The nano era is mainly based on nanotechnology, and the use of existing information technology has a profound impact on people's life and learning style. However, from an objective point of view, our grasp of nanotechnology has not reached a mature level. Sometimes, the nano era we expect has not really come. The characteristics of nanotechnology are high precision, high depth and strong universality. If we hope that technology can produce technological changes in our social life and become the industrial revolution of the 21st century, we still have a way to go.

## 2 Nanotechnology influences sports competition

Nanotechnology, as its name implies, has swept the world with a rapid speed, and competitive sports are also deeply influenced by nanotechnology. Nowadays, athletics is no longer a single player for athletes. It is no longer the same as in the past. Athletes only rely on hard training to achieve success. Now the era requires multi-disciplinary cooperation in sports training. Nanotechnology can deeply tap the potential of athletes, produce more efficient sports equipment, and produce more professional supervision and management vessels. Nanotechnology can promote the vigorous development of sports, and it has become a tacit fact that the light of science and technology can bring gold medals to China's sports. Nano system contains a lot of physical properties, such as its photothermal battery, which is obviously different from other ordinary materials. These good effects will provide better sports conditions for sports competition. The combination of nanotechnology and sports competition provides a great

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opportunity for the rapid development of sports competition.

First of all, in China's sports, many specific equipment and equipment need to be achieved through nanotechnology. Athletes can use these innovative sports equipment to train their physical fitness and the subjects they are good at, and help athletes get better results in the next competition. Behind the gold medal winning of each athlete, there is actually the shadow of sports equipment innovation, such as the establishment of standard circular ring, and the construction of high-altitude platform, which create good sports conditions for the athletes, which can make the athletes practice more skillfully and meet the standards. In the era of nanotechnology, in order to help athletes better train, people have also invented the mysterious shark skin swimsuit, the glass fiber rod, the shocking high hit rate arrow and so on. Although athletes' own efforts are the most important reason to win the championship. But it is also because of the emergence of these equipment, so that athletes have the courage to overcome difficulties in the world arena, constantly write world historical records, to break, to innovate. Athletes holding suitable nano sports equipment, not only reflects their own personality, but also makes themselves more involved in the competition, which is conducive to the athletes to create better results.

Moreover, scientific sports can guarantee the normal development of modern sports training. Therefore, modern equipment and modern communication equipment have become the mainstream of modern scientific training. If we apply nanotechnology to today's computer technology, we can increase the efficiency of computers by several 100000 times, and make computers have more efficient transmission frequency. In addition, nanotechnology can store more information. A nano processing disc can store about 300,000 Chinese characters, and its storage capacity can be hundreds of times more than that of ordinary optical disks. For example, Beijing library has a collection of 20 million books. If we print the contents of these books on nano laser disks, the storage capacity of nano optical disks is less than 1/30, which shows that the storage capacity of nano optical disks is very large. Therefore, in sports competition, we can make nano products, whether it is to add the existing sports books and materials, training methods, etc. to the nano CD-ROM, or the application of nanotechnology to electronic products, will greatly improve the efficiency of sports competition. At the same time, we can also apply nanotechnology to the management equipment of sports competition, such as supervision equipment, so that I can use the equipment to correct the wrong posture of athletes and innovate the movements of athletes, so that athletes can better grasp the details of each action, at the same time, it can help the referee to better supervise whether the athletes violate the rules. Such nanotechnology will bring higher work efficiency for sports competition.

Finally, we pay attention to the development of nanotechnology and promote the development of nanobiology. Nanotechnology allows us to have a deeper understanding of the precise structure and functional

properties of small molecules at the nanoscale. Once a famous foreign sports medicine master once put forward such a view: there is 60% probability that human body function is determined by heredity, while only 40% probability is affected by other factors. Modern medicine gave birth to the Manhattan Project, which can test human genes to determine whether a person has great exercise potential from a genetic point of view. We can determine the position of the athlete's maximum potential and limit by measurement. Nanotechnology makes it possible for people to study human body functions at the molecular level. Through scientific diagnosis and efficient gene testing, the country can select a group of excellent and potential athletes. At the same time, nanotechnology can be used in the field of pharmacology. Nanotechnology has played an important role in controlling the release system, improving the utilization of organisms, and improving the targeting of drugs. After entering the human body, these drugs can actively repair the damaged tissue cells of human beings, and will not leave any garbage in the human body. The emergence of these drugs can provide a good material basis for athletes. If the athletes are injured on the field or have accidents during training, they can be used for related treatment.

### **3 Severe challenges of competitive sports in the nano Era**

Since entering the 21st century, nanotechnology has been developing unprecedentedly, especially in this era of rapid development of science and technology, nanotechnology can be widely used in various occasions, therefore, we can also think that the current era can also be called the nano era. Nowadays, with the development and application of nanotechnology, it has been promoted and applied in sports competition, and the use of nanotechnology can make the sports industry flourish. However, it is undeniable that nanotechnology is also a double-edged sword. In the development of sports, if there is a good side, there will inevitably be a bad side. In the lessons of history, we can know that science and technology can make the sports industry develop better, but it will also bring serious consequences. With the help of science and technology, sports competition is more excellent, but the physical and mental health of athletes is affected, which is against the spirit of the Olympic movement. Therefore, we should make good use of science and technology, and let nanotechnology be used properly. While bringing development to the sports industry, we should also follow the spirit of sports competition. We should consider this problem from the future sustainable development, how to use nanotechnology, what impact will be brought to the sports industry after using nanotechnology, both good and bad aspects should be considered. Only in this way can nanotechnology and sports industry progress together and provide reliable theory for the development of the industry.

### 3.1. It may damage the physical and mental health of athletes

3. With the development of the times, nanotechnology has been widely used in various fields, sports have also adopted the technology. It is true that technology has brought convenience to sports, but in this process, the contact between athletes' skin and nanoparticles is inevitable. Although skin is a barrier for human beings to block substances, it has no resistance to some micro nanoparticles. Nanoparticles may penetrate into the body and diffuse in the body when contacting with the skin. Sometimes they even enter the organelles such as mitochondria, endoplasmic membrane and other organelles through the gap of biomembrane to produce chemical reactions with large biomolecules, resulting in changes in the conventional stereostructure of macromolecules or biofilms, resulting in the loss of enzyme and hormone activities in the body, and even the change of genetic materials, which can accelerate the aging of tumors. There are also some problems, such as penetrating blood testis barrier, affecting sperm production, reducing sperm motility, hindering embryonic tissue differentiation, resulting in fetal malformation and congenital diseases.

### 3.2. It may cause imbalance in sports development

When the original sports do not exist with high technology, and sports are not eroded by new technology, people pursue a higher, faster and stronger level. In the process of sports competition, athletes display their strong physique, challenge the limits of their bodies, and show the superiority of human beings in distinguishing animals in physiology. The competition is fair, fair and open. With the development of sports and social economy, people's values have changed and deviated from the right track. The temptation of money, reputation and status brought by competition leads to the deviation of simple sports from the route and cannot be returned. As one of human civilization, modern high-tech has become the main means to improve sports performance. In order to win, gain fame and fortune. In this kind of high-tech sports competition, the Olympic principle of justice has been destroyed, and the dominant position of athletes has been weakened. It's not the strength of athletes, but the advantages of modern technology compared with old technology. Competitive sports is originally a kind of innate ability, but now the significance of the original training level comparison has been partially lost, and competitive sports tend to one strange circle after another. Perhaps the birth of nanotechnology is not a good thing for sports.

The development and dissemination of new technology need strong economic strength to promote. Even with advanced science and technology, it is very difficult for a country with insufficient comprehensive national strength to popularize it. Although the international community has been advocating the sharing

of science and technology, in reality, there has been regional inequality in the development of science and technology. In addition, as an emerging core technology, nanotechnology needs high investment, high technology and high precision, which many developing countries cannot achieve. Developed countries rely on national strength, steady development, monopoly of specific projects, thus promoting economic development, while developing countries can only sigh, lack of financial and technical support, reduce their interest in developing their own sports development, a vicious circle. External factors are also the important factors that lead to the internal failure to obtain fair competition in competitive sports.

With the development of sports, a lot of high-tech products have been developed. For example, the emergence of stimulants. With the continuous development of modern high-tech, the variety of doping is shocking. Because of its small structure, nano materials and nano motors are more likely to be used in doping. The development of nano drugs may increase the types of prohibited drugs, the detection is difficult, doping detection should be strengthened!

## 4 Conclusion

Competitive sports is the intangible culture inherited by human history, which enriches the spiritual life of human beings. It is a huge wealth and worth inheriting. The intervention of science and technology can promote the development of competitive sports, but the future of competitive sports can not completely rely on the development of science and technology. The combination of science and technology and sports affects the real strength of athletes and the sense organs of the audience. The nano era is undoubtedly the springboard for the development of competitive sports. However, in the wave of nanotechnology, we should also realize that competitive sports are facing severe challenges in the era of nano technology, and the investigation of cheating in sports competition will increase the difficulty. The national sports department should consider the impact of nanotechnology development, explore its future development direction, establish nanotechnology development plan, strengthen social education as soon as possible, and explain the punishment for violations. On the basis of the competition in the field of nanotechnology, rational layout should be made. Facing the challenges of the nano era, we should be confident, not nervous!

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