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Editorial

Advanced Biotechnologies

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Biotechnology has developed rapidly, especially at the end of the 20th century. In the early year of 1944, Avery et al. proved DNA as a carrier of genetic information. In 1953, Watson and Crick proposed a DNA double helix structure model, which clarified the half-reserved replication mode of DNA and thus opened a new era of molecular biology research. In the following 1970s, the establishment of DNA recombination technology revolutionized the modern biotechnology and since then, all life activities have been demonstrated to be the result of functional biological macromolecules including enzymes and non-enzymatic proteins. Biotechnology has shown broad application prospects and brought hope to solve a series of problems that human beings are facing, such as disease prevention, food shortage, population expansion, environmental pollution, and energy shortage, thereby attracting the attention of all countries in the world.

In the early decade of the new millennium, the total number of reports on life sciences, biotechnology and related fields accounted for more than 50% of the global natural science publications. With the completion of genome sequencing on more and more biological samples, human understanding of the living world has undergone a qualitative change. Moreover, scientists have turned their focus from the function of individual genes to the delicately regulated gene networks, while a better knowledge of all these will inevitably bring humans closer to the goal of manipulating the whole organism.

At present, the world is facing "great changes unseen in a century." From the perspective of science and technology, it is ushering in a historic intersection of a new round of scientific and technological revolutions. As one of the fastest-growing cutting-edge technology fields in the 21st century, biotechnology has become an important engine for this technological revolution. The development and transformation of biotechnology will not only bring huge benefits to human society through subversively changing the fields of scientific research, public health, agriculture, energy and environmental protection, but also affect the global technological, political, and economic structure, and even profoundly the development process of human mankind. As such, opportunities and challenges coexist along with the development of biotechnology.

The theme of this special issue of *Fundamental Research* is the Advanced Biotechnologies. This special issue collects five original research articles and one perspective. The topics cover RNA methylation, RNA probing, phase separation, live cell imaging, personalized vaccines and biomolecule manipulation. We hope this issue will initiate and promote wider scientific communication in the advanced biotechnologies and their related frontier research areas.

Finally, as guest editors of this special issue, we cordially thank all the authors for their contributions as well as the editorial board members and the referees for their thoughtful advice. We also acknowledge the excellent editorial assistance of Dr. Can Liu and Dr. Mei Han during the whole process.

Declaration of Competing Interest

The authors declare that they have no conflicts of interest in this work.

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