

## Preface

Bioengineering technologies are the core of the 21st century high-tech revolution, and the biotechnology industry is a pillar industry in the 21st century. Currently, bioengineering technologies play a strong role in solving the major problems of food, health, environment, resources, population and energy, which human beings now have to be faced with. Biotechnologies are widely used in medicine and health, agriculture, light industry, chemical and energy, and so on, and have promoted modification of the traditional industry technologies and formation of the emerging industries. Bioengineering technologies have permeated almost all disciplines and are closely related with daily life of people, economic and social development. There will be more outstanding talents of various disciplines to participate in research and development in the edge fields which cross with life sciences in the 21st century.

In order to strengthen and improve students' consciousness of high-tech, train high-quality talents, making college students in higher level consciousness of bioengineering technologies for their future job and the meaning of life, understand the research situation in bioengineering technologies and the development trend of life sciences in the world, the authors of this book extensively collected and borrowed domestic and foreign advantages of similar materials and technological literature in recent years, and finally this book, "Contemporary Biotechnology and Bioengineering", as a teaching textbook for non-bioengineering undergraduates in higher education institutions, was written and now has completed. By reading and learning from this book, most students have a basic understanding of trends and hot spots on life sciences in the 21st century and the knowledge of the major disciplinary development direction of bioengineering technologies and the areas to be covered in the future, so that during their major study students can find the integration point between bioengineering technologies and their own specialty, and become proficient in application of bioengineering technologies to their own specialty, so as to inspire their thoughts to pioneer and innovate, and lay the foundation for their future professional development. We hope that you will find this book a useful revision aid and a stimulus for further study.

This book was translated from Chinese version "Contemporary Biotechnology and Bioengineering" published in 2005 by Science Press, Beijing, China. The contents of the book include 13 chapters, covering not only basic knowledge and basic theories of both contemporary bioengineering technologies, but also their application in various fields and the impact on human society. In the case of constrained class number, teaching content should be concise rather than exhaustive, and should give students the space for studying themselves. For this book, Chapter 1: Introduction; Chapter 2: Science basis for contemporary bioengineering; Chapter 3: Gene and genome; Chapter 4: Gene engineering; Chapter 5: Cells and cell engineering; Chapter 6: Enzyme and enzyme engineering; Chapter 7: Microorganisms and fermentation engineering; Chapter 8: Contemporary bioengineering technologies and agriculture and light chemical industry; Chapter 9: Contemporary bioengineering technologies and biomaterials; Chapter 10: Contemporary bioengineering and biological medicine; Chapter 11: Infection and immunity; Chapter 12: Biodiversity and environmental management; Chapter 13: Safety and social ethics of contemporary bioengineering technologies.

Because of fast development of contemporary bioengineering technologies, and involvement in a wider range of knowledge, and owing to limitation of the author's knowledge level and writing skill, the errors in this book are inevitable, I would like to welcome valuable advice from all readers, and all the compiling staff will be greatly appreciated.

HE Xiaoxian  
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We would like to dedicate this book to our parents.