

PREFACE

This book is written to provide an introduction to the rapidly advancing, interdisciplinary field of Bioengineering. The theme of the book is integrative bioengineering, which brings together the fundamental concepts and techniques in engineering and biomedical sciences and demonstrates their interplays.

This book evolved from the book *Introduction to Bioengineering* edited by Y. C. Fung and published in 2000 also by World Scientific Publishing Co. which was written primarily as a textbook for bioengineering undergraduate students. The current book is still well suited as an introductory text for bioengineering undergraduate students, but it can also be used for bioengineering graduate students. Furthermore, it would be very valuable as a reference book or introductory text for scientists and students in other disciplines in engineering or in the life sciences who would like to learn the fundamentals of bioengineering and to invent.

This book covers bioengineering of several body systems, organs, tissues, and cell types, integrating physiology with engineering concepts and approaches. It presents novel developments in tissue engineering, regenerative medicine, nanoscience and nanotechnology. It addresses the state-of-the-art of genomic engineering and systems biology. Furthermore, it discusses socio-economic aspects of bioengineering.

Thus, this book integrates (1) biology, medicine and engineering, (2) different levels of the biological hierarchy, (3) basic knowledge with applications, and (4) science/technology with ethics/entrepreneurism/translation. The chapters are written by authors who have outstanding accomplishments in their fields, with extensive use of diagrams and graphics. The book is organized and edited in a cohesive manner to facilitate learning and to stimulate innovation.

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Editors