Preface

It was May 2015 when I was invited to join the editorial team of the "Translational Medicine Publication Project." I proposed to edit a book entitled *Translational Bioinformatics (TBI)*. I was happy to have invited a few colleagues from China and the USA who are experts in the field to join me as coeditors, Profs. Yilong Ma, William C.S. Cho, and Fengfeng Zhou. Prof. Qin Xu from my research team and my PhD student Huiyuan Zhang spent much time in managing the project. It has been many years since I started to collaborate with Springer. Our proposal was approved quickly as a collaboration project with the Shanghai Jiao Tong University Press.

TBI is an emerging field in the study of health informatics, focused on the convergence of molecular bioinformatics, biostatistics, statistical genetics, medical imaging, and clinical or medical informatics. Its focus is on applying sound informatics methodology to the increasing amount of biomedical and genomic data to formulate knowledge, disease models, and medical tools, which can be utilized by scientists, clinicians, and patients. TBI employs data mining and analytical biomedical informatics in order to generate clinical knowledge for a wide array of applications. Furthermore, it involves cross-disciplinary biomedical research to improve human health through the use of computer-based information systems. This new field has achieved great success in the recent decade by synergic integration of the molecular and genetic footprints in tissue cultures, animal models, and patients with various diseases.

Our book tries to cover, but not limited to, the following topics:

Biomedical knowledge integration
Data-driven view of disease biology
Biological knowledge assembly and interpretation
Human microbiome analysis
Pharmacogenomics
Mining electronic health records in the genomics era
Small molecules and disease

Protein interactions and disease
Network biology approach to complex diseases
Structural variation and medical genomics
Analyses using disease ontologies
Mining genome-wide genetic markers
Genome-wide association studies
Cancer genome analysis
Medical bioinformatics: biomarkers and medical imaging
Neuroinformatics of neurological and psychiatric disorders
Neuroimaging genetics

It is a challenging task that these topics are quite diversified and involved scientists with various expertise. Finally, we tried our best to summarize these diverse topics into five Parts, as in the Contents, with the chapters 2, 6, 10, 14, 16 and 17 edited by Yilong Ma, the chapters 3, 8, 11 and 13 edited by William C.S. Cho, the chapters 5, 6 and 7 edited by Qin Xu, as well as the chapters 1, 4, 9, 11, 12, 14, 15 and 16 edited by Fengfeng Zhou. My assistants Mrs. Ruili Zhao and Ms. Qiuyuan Hu made great efforts in soliciting manuscripts. Mrs. Becky Jinan Zhao from Springer and Mrs. Min Xu and Zhufeng Zhou from the Shanghai Jiao Tong University Press give us a lot of help in formulating this book and applying for funding.

In 2015, we enter the era of "precision medicine," which integrates two major contemporary developments including various omics (e.g., genomics, proteomics and metabolomics) and Big Data. I believe the TBI would play an important role in the endeavor for precision and personalized medicine.

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