Preface

The field of oncology is now in the midst of evolution owing to rapid advances in biotechnologies and cancer genomics that increasingly accelerate our understanding of cancer biology and the development of new diagnostics and therapeutics. This field is actually becoming one of the most promising disease fields in the shift toward precision medicine, involving the provision of a new paradigm of clinical trials based on molecular markers. Accordingly, many new statistical challenges have emerged in this field which warrant further progress in the methodology and practice of biostatistics. Importantly, biostatisticians have a critical role more than ever in the discovery of disease mechanisms/biomarkers and in the development of effective healthcare strategies for disease prevention, early detection, and treatment. Based on the accumulation of their experiences in these medical researches, biostatisticians will help establish the new framework of evidence-based medicine in the new era of precision medicine, with advanced statistical methodologies and tools.

This book presents state-of-the-art biostatistical methods and their applications in various stages of current cancer studies. Topics include molecular epidemiology, disease screening, complex clinical trials with drug combinations or predictive biomarkers, development of prognostic biomarkers/risk calculators, meta-analysis, and the analysis of large-scale omics and imaging data. Several chapters, providing general overviews on specific topics or fields in cancer research, would be beneficial for very wide audiences, including clinical investigators, translational scientists, and others who are involved in clinical studies. Several chapters provide nice methodological overviews for specialists and students in biostatistics and bioinformatics. On the other hand, as one of the unique features of this book, many chapters provide lush aspects in practical biostatistics that would be beneficial for practitioners and, also, methodologists and students in biostatistics.

Lastly, this book project was motivated by the first Pacific Rim Cancer Biostatistics Conference in Seattle in the summer of 2015 to establish an international network of biostatisticians in the oncology field. We sincerely express our thanks to all of the contributors to this project, who are leading experts in academia and government organizations for providing the "frontiers" of biostatistics in this

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