

PREFACE

Recent advances in genomic and proteomic research into the molecular biology and biochemistry of cancer have revealed critical differences between normal and malignant tissues. Exploiting these differences, investigators from academia as well as the biotechnology and pharmaceutical industries have underscored key processes that regulate the growth and progression of cancers. Bioinformatic integration of these findings within an evolving systems biology network has spearheaded the development of specific and selective therapeutics that target differentially expressed markers of pathways implicated in cellular proliferation, differentiation, metastasis, evasion of immune surveillance, angiogenesis, and apoptosis. These approaches have resulted in a modest clinical survival benefit for certain cancers, yet many challenges remain, including combinatorial approaches with standard cytotoxic chemotherapy as well as antiangiogenic therapy.

The main objective of *The Oncogenomics Handbook* is to provide a comprehensive update of a variety of perspectives and the consequential approaches toward advancing cancer therapy. Most importantly, we hope to paint with broad strokes and representative examples the drug development process as a network whose components are intimately linked with one another and progressing together from the discovered target to the ultimate therapeutic product. As an accurate reflection of the state of the art, we have brought together outstanding translational research from both academia and the biotechnology sectors.

This handbook is organized into seven parts. The first begins with a discussion of genomic databases and presents examples of elegant approaches to discover oncological targets. The second part expands the understanding of the tractable genome from the gene and transcript to the realm of proteomics that provides an understanding at the level of protein biochemistry. The third and fourth parts move from the chemical realm to that of the living cell and ultimately animal modeling, where preclinical cell biologists and animal pharmacologists translate proof of concept models toward clinical development. The fifth part of the book provides an overview of clinical diagnostics, bioanalytics, and biomarkers, as well as the importance of these molecules to therapeutic outcome. The sixth part of the book is divided into three sections that present antiangiogenic, supportive, immunomodulatory, and tumor-targeted approaches to cancer therapy. The final part of the book provides a systems biology bioinformatics overview of strategies and initiatives leading the post-genomic era. Although many of these approaches are in different stages of clinical development and present examples of future cancer therapies, several have resulted in some clinical benefit for certain cancers. Although many challenges are presented, optimism surrounds the potential use of combination therapies using approved cytotoxics, novel small molecule inhibitors, antiangiogenics, monoclonal antibodies, vaccines, immunomodulatory drugs, and radiation therapy. As always, much work needs to be done.

The *Handbook of Oncogenomics* should prove useful as a text for advanced undergraduate or graduate courses that focus on the drug development process from discovery to clinic. It may also be used as a complementary text for scientific professionals seeking to expand their knowledge of the rapidly progressing fields of cancer research. Finally, although many of the sections of the book focus on scientific professionals, the book covers concepts and issues appropriate to a wide range of professionals, including those involved in consulting services and marketing related to the specialized knowledge contained herein.

William J. LaRochelle, PhD
Richard A. Shimkets, PhD



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LaRochelle, W.J.; Shimkets, R.A. (Eds.)

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