
Preface

Throughout the world, breast cancer has increased in incidence in the last decade. Conversely, there has been a decrease in mortality as a result of an emerging combined therapy approach that includes systemic application of treatment modalities, such as chemotherapy and hormone therapy, combined with early detection. Based on the molecular understanding of the disease, many new treatments have been introduced into the clinic in the last five years, including antibody therapy to *HER2*, pure antiestrogens, and aromatase inhibitors. It is vital for breast cancer research to be able to link studies on cell lines and in preclinical models to studies of human tumor material. There are also many new technologies involving large-scale analysis for the expression of genes, such as proteomics and gene array analysis. Unprecedented opportunities have arisen for clinical application. Ultimately, these each need to be tested in randomized prospective studies modulating the target of interest.

Breast Cancer Research Protocols aims to cover the majority of the techniques that would be necessary for a research scientist or clinician intending to enter into this field and initiate research, as well as to communicate with others on methodologies and approaches. Because of the dramatic increase in the diagnosis and therapy of breast cancer, it is particularly important that these approaches be integrated for patient benefit in the long run.

Thus, this book of protocols initially covers how to collect and handle human breast tumor samples appropriately, and how to extract them for their constituent DNA, RNA, or proteins. Because samples are often quite small, the technology of handling biopsies appropriately is important. The new methods of analyzing gene expression are also described, as breast cancer has actually been one of the areas where this has been successfully applied.

One of the most important areas in breast cancer treatment is understanding prognosis and being able to select patients that are at highest risk. This is covered for all the major surgical and pathological criteria currently in use.

Validating targets and understanding the biology of newly discovered genes is critical and methods of analyzing cells in vivo and in vitro are also described. Based on these combined approaches, we hope that *Breast Cancer Research Protocols* will contribute to further advances in effective management and therapy of breast cancer in the future.

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