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FROM LOCAL INVASION TO METASTATIC CANCER

Involvement of Distant Sites Through the Lymphovascular System

Edited by

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Acknowledgements

We are grateful to the National Cancer Institute and NIH Office of the Rare Diseases for their support of the 2nd International Symposium on Cancer Metastasis and the Lymphovascular System: Basis for Rational Therapy being held in San Francisco, CA from May 2–5, 2007. We would like to thank the staff at Humana Press/Springer, Paul Dolgert, Frances Louie and Frank McGuckin, for their advice and expertise in making this book possible.
Foreword

This textbook captures the highlights of the timely symposium on cancer metastasis and the lymphovascular system. The symposium provided a unique forum for the convergence of biomedical research breakthroughs, presented by basic scientists, surgeons, radiologists, immunologists, and others, to address the central role of the lymphovascular system in the spread of cancer. The perspectives offered by experts in their respective fields of scientific inquiry inspired cross fertilization of ideas and paradigm-shifting hypotheses.

Regional lymph node metastasis is considered a prognostic indicator for the aggressive potential of solid tumors. However, despite recent advances in cancer biology and experimental therapeutics, critical gaps remain in our understanding of the molecular regulation of lymph node metastasis involving lymphatic invasion as a key feature. Lymphatic vascular biology has earned a prominent position in the field of cancer research, and lymphangiogenesis appears to be an attractive new target in the war against cancer.

The panel of experts assembled for the symposium reviewed the current status of basic, clinical and translational research in the field, including model systems to study lymphangiogenesis and angiogenesis; molecular imaging of lymph nodes; and therapeutic targeting of the lymphovascular system. The confluence of new knowledge and ideas was supported by a presentation on the vision of the National Cancer Institute. Perhaps no other time in the history of medicine has there been a strategic alignment of breakthroughs in biology, technology, and clinical research to advance the field in cancer metastasis and the lymphovascular system.
Preface

The aim of this book is to trace cancer metastasis from the primary sites to the regional lymph nodes and distant organs through the mechanism of local proliferation resulting in metastasis through the lymphovascular system. Rational therapy may be developed to curb the process of metastasis upon understanding these crucial steps of metastasis. Whether the cancer cells utilize the lymphatic or vascular channels or both to metastasize will be examined.

This book summarizes the 2nd International Symposium on Cancer Metastasis: Basis for Rational Therapy being held in San Francisco from May 3–5, 2007 by bringing together the basic scientists and clinicians to ask the central question of the role of the lymphovascular system in the spread of cancer. Thus, this book is able to link the bench to the bedside and vice versa in understanding the mechanisms of cancer metastasis.

In human solid cancers, the nodal status is the most important prognostic indicator for patients’ outcome. Recent developments in the sentinel lymph node (SLN) concept and technology have resulted in the application of such a procedure to define the first draining node or SLN as the primary gateway through which the cancer will spread.

Part I addresses several important developments in the biology and clinical aspects of cancer metastasis. Part II describes the relationship between tumor microenvironment and proliferation. Part III defines the process of lymphangiogenesis and angiogenesis with special reference to cancer metastasis. Part IV summarizes the development of multiple approaches in the imaging of cancer during its course of metastasis. Part V attempts to use the lymphatic system as a target to treat cancer. Part VI updates the latest cellular and molecular mechanisms of cancer metastasis. Part VII examines the role of molecular targeted therapy against growth factor receptors, signaling pathways and angiogenesis as therapeutic targets. Part VIII emphasizes the impact of tumor burden in the sentinel lymph nodes on the clinical outcome in several solid cancers. Part IX defines immune responses in the draining lymph nodes against cancer relating to immunotherapy against cancer. The role of cancer stem cells is being explored in Part X. With advent of molecular techniques, the genomic signatures of cancer may be developed and analyzed in Part XI. Parts XII and XIII summarize the therapeutic results of using new approaches in cancer treatment. Any promising leads from clinical trials in metastatic cancer may be used in the future as adjuvant therapies for occult metastatic deposits. Part XIV poses unanswered questions as future perspectives.

Perhaps, more uniquely, this book will bring the basic scientists, radiologists and clinicians together resulting in cross fertilization between these disciplines with intention to develop strategies to curb the process of metastasis.

San Francisco, CA

Stanley P. L. Leong, M.D.
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