

Preface

The recent decade brought a tectonic shift in our understanding of the mechanisms regulating tumor development, progression, and metastases. During the majority of the last century, it was widely believed that these processes are governed mainly by genetic alterations in tumor cells. An incredible effort was expended to uncover the molecular mechanisms responsible for genomic instability, tumor cell survival, invasion, metastases, etc. Many transcription factors and signal transduction pathways were implicated in these processes. Not surprisingly, all six of the hallmark capabilities of cancer, suggested by Hanahan and Weinberg in their seminal review in 2000, included traits associated only with tumor cells. However, at the end of the last century, it became increasingly clear that the molecular abnormalities associated with tumor cells could not explain the complexity of the events involved in the regulation of tumor progression. It is now evident that the tumor microenvironment plays a major role in these processes. Epidemiological and experimental data have directly implicated inflammation as one of the major factors responsible for tumor development. The host immune system was shown to play a major role in control of tumor progression. Myeloid cells were demonstrated to be a critical factor in promoting tumor cell invasion and metastases. Tumor development and progression represent intricately connected circuits of intrinsic (associated with tumor cells) and extrinsic (associated with tumor microenvironment) factors. The understanding of tumor biology is impossible without a clear understanding of the role of tumor microenvironment. In 2011, Hanahan and Weinberg revisited those hallmarks of cancer and added the evasion of immune destruction as an emerging new hallmark, and tumor-promoting inflammation as one of the enabling characteristics of cancer. It is evident that, in the near future, tumor microenvironment will occupy an even more prominent role in our understanding of tumor biology.

The cells of the immune system represent, arguably, the most critical element of tumor microenvironment. They are not only responsible for the immune control of tumor progression, but are also involved in tumor cell invasion, conditioning of the metastatic niche, angiogenesis, etc. This book is focused on the analysis of the different components of the immune system, in the regulation of tumor progression.

It presents a unique opportunity for readers to put together the complex and often convoluted relationship between different immune cells and tumors. The editors and contributors effectively presented a logical and comprehensive overview of this complex issue. Readers will find information about the role of inflammation in promoting tumors and the regulation of antitumor immune responses; the analysis of the different immune suppressive mechanisms responsible for tumor escape; the evaluation of abnormalities in different immune cells in cancer including dendritic cells, natural killer cells and T cells, as well as the contribution of regulatory T cells, myeloid-derived suppressor cells, granulocytes, mast cells, and macrophages into tumor progression.

However, this book goes far beyond just a description of the immunological abnormalities in cancer. It presents an overview of therapeutic strategies in targeting both tumor cells and tumor microenvironment. The unique value of this volume is that cancer immune therapy is discussed in the context of the regulation of tumor microenvironment. Finally, this book offers the analysis of the biomarkers of immune responses in cancer, the field that is extremely important for the design and evaluation of numerous immune therapeutic strategies.

I believe this book provides a rare example of the synthetic approach to complex biological problems and is a must read for people interested in the role of the immune system in tumor–stroma interaction.

Dmitry I. Gabrilovich MD, Ph.D.
Robert Rothman Endowed Chair in Cancer Research
Head, Section of Dendritic Cell Biology
H. Lee Moffitt Cancer Center and Research Institute,
Professor of Oncologic Sciences and Molecular Medicine
University of South Florida
Tampa, FL, USA

References

- Hanahan D, Weinberg RA (2000) The hallmarks of cancer. *Cell* 100(1):57–70
Hanahan D, Weinberg RA (2011) Hallmarks of cancer: the next generation. *Cell* 144(5):646–674

The Tumor Immunoenvironment

Shurin, M.R.; Umansky, V.; Malyguine, A. (Eds.)

2013, XVI, 745 p., Hardcover

ISBN: 978-94-007-6216-9