

# Preface

This is an exciting time in Oncology! The tremendous progress in our understanding of genetic and epigenetic alterations that drive the oncogenic process has provided a number of new opportunities for the development of more effective and less toxic anticancer therapies. More importantly, the emphasis that researchers have placed on the cross-talk between cancer cells and the host is finally paying off, with novel therapeutic strategies boosting the patient's immune system generating transformational results in diseases that were difficult to treat with available therapies. The interaction between cancer cells and immune cells takes place in the context of a tumor microenvironment that is profoundly impacted by many factors. This book emphasizes the role of a universal adaptive mechanism, i.e., adaptation to changes in oxygen levels, as a fundamental biological variable of the tumor microenvironment. The inevitable imbalance between oxygen demand and supply caused by a dysfunctional and inefficient tumor vasculature is a hallmark of human cancers. The unprecedented progress in elucidating the molecular mechanisms underlying tumor hypoxia has fueled enthusiasm and efforts in better understanding the biological implications and exploiting potential therapeutic opportunities. This book attempts to capture this wealth of information in a coherent and comprehensive collection of contributions by world renowned scientists and investigators, involved in basic, translational and clinical research. The goal of this book is to provide a framework to generate novel hypotheses and opportunities that can ultimately be translated to the clinic to benefit cancer patients. Despite the unquestionable progress in the development of novel cancer therapies, achieving cures in metastatic disease remains an elusive and sought-after goal. Only a comprehensive and systematic approach that takes into account all of the components that ultimately embody the “oncogenic paradigm” will allow to overcome this challenging disease.

It has been a privilege for me to have an opportunity to work with such a talented group of scientists and investigators and I would like to thank all of them for their outstanding contributions to this book. I also would like to thank all of the patients who participate in clinical trials and contribute to the progress in the development of novel and more effective cancer therapies. Lastly, I would like to thank my family; without them I would have never been able to do what I love.

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Biological Implications and Therapeutic Opportunities

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