

Preface

FROM THE TIME ABERRANT WHITE BLOOD CELLS were first described in the nineteenth century, to the discovery of chromosomal aberrations in the mid-twentieth century, and to the recent explosion of genomic and single-cell analyses, studies of blood cancers have always been at the vanguard of discovery. These milestones changed how we understand normal and malignant hematopoiesis and informed broader understanding of immunology, gene regulation, cancer biology, and targeted therapy.

In this book, we have focused on the biology of cancers of the hematopoietic system, including leukemias and lymphomas. The study of these diseases has laid the foundation for fundamental discoveries in biomedical science and paved the road for translational impact across the spectrum of human cancers. We examine the latest findings and thoughts about the etiology of hematological malignancies, the models used to study them, and the newest paradigms for understanding their biology and developing rationally designed therapies. The development of novel technologies and the accelerated pace of discovery have revealed how remarkably heterogeneous these tumors are and provided significant insight into the normal and malignant physiology of the tissues these tumors affect. This has given us a better appreciation of the significance of cell-context-specific factors and the impact of specific genetic drivers, but at the same time raises many new and ever more complex biological questions.

We assembled experts in myeloid and lymphoid neoplasms to address the key topics in this field. These include studies of the genomic and epigenomic basis of hematopoietic transformation, and how these have led to new insights into how gene regulatory networks are co-opted during transformation and can be leveraged to yield therapeutic benefit. The authors describe in great detail different mechanisms of transformation, both with respect to cell-autonomous processes, including signaling, stem cell biology, and self-renewal, and non-cell-autonomous mechanisms, including immunological activation/escape and interactions with the niche. They describe state-of-the-art preclinical models of hematologic cancers and how these can be used for mechanistic and therapeutic studies. Most importantly, this book illustrates the complexity of hematopoietic and immune system transformation and how new and important concepts relevant to diagnosis and management of leukemia and lymphoma have emerged.

The editors want to thank Barbara Acosta and her Cold Spring Harbor Laboratory Press colleagues for their tireless support and for marshaling this book from conception to completion. We greatly appreciate Barbara's patience, understanding, and organizational skills and her ability to keep the editors and authors on schedule. We apologize in advance if we have failed to include or to cite our colleagues or if we failed to adequately address a topic or concept or missed the latest findings in a specific area. Last, we also want to thank all the authors, contributors, and experts from our laboratories who participated in putting together this volume and ensuring it includes the latest and most exciting findings about leukemia and lymphoma.

MICHAEL G. KHARAS
ROSS L. LEVINE
ARI M. MELNICK