

Preface

Over the past decade, we have witnessed major advancements in the understanding of the molecular mechanisms and pathophysiology of pulmonary hypertension (PH) that occurred in parallel with the discovery and development of new therapies. Pharmacological agents that modulate the main pathophysiological pathways of pulmonary arterial hypertension, including endothelin-1, nitric oxide, and prostacyclin, have changed the course of this devastating disease by relieving symptoms and improving and prolonging patients' lives. Moreover, molecular biological tools have supplied a wealth of knowledge about the roles of established and emerging signaling pathways in PH. This book is an example of how pharmacotherapy can further expand our understanding of such a heterogeneous group of diseases as PH.

Written by leading experts in the field, this volume focuses on current, evidence-based pharmacological treatments of various forms of PH and also provides a comprehensive review of most recent developments in this area. The first part of the book covers definition, classification, pathophysiology, pathology, biomarkers, and animal models of the disease, thus laying the conceptual basis for what follows. The middle section provides an overview of the established therapies such as calcium channel blockers, prostanoids, endothelin receptor antagonists, phosphodiesterase-5 inhibitors, and inhaled nitric oxide. The last section explores novel pathways and emerging therapeutic approaches including soluble guanylate cyclase stimulators, Rho-kinase inhibitors, inhibitors of serotonin receptors and transporters, peptide growth factors, vasoactive peptides, modulators of redox equilibrium and cyclic nucleotides homeostasis, as well as immunosuppressive and anti-proliferative agents. Particular attention is given to clinical applications of these experimental therapies, which are on the horizon, thus spanning the continuum from basic science to clinical applications. The catalogue of signaling cascades in PH is rapidly growing and with it the wish to modulate these pathways for therapeutic reasons. We can expect to see further progress and achievements in developing novel therapeutics over the next decade, with new improved agents in established drug classes, new drug classes in established pathways, and novel drugs aimed at new molecular targets.

We hope that this book will help the reader appreciate the importance of elucidating the pathophysiology of PH and the research on new signaling pathways and their biochemical and genetic background. It also showcases the commitment of academia and industry to drug discovery and development focusing on this devastating condition. Unfortunately, despite recent advances in the understanding of the molecular mechanisms and pathology of PH, this disease remains incurable. There is still a significant need for identifying new therapeutic targets and developing new treatment options. Undoubtedly, exciting times lie ahead of us, for both the science and the patients. If this book helps to stimulate further research and improve patient care, the wishes of the authors, the editors, and the editorial manager, Susanne Dathe, will be fulfilled.

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