

# Contents

## **Part I Ion Channels in the Pulmonary Vasculature: Basics and New Findings**

<b>The Role of Ion Channels in Hypoxic Pulmonary Vasoconstriction .....</b>	<b>3</b>
E. Kenneth Weir, Jesús A. Cabrera, Saswati Mahapatra, Douglas A. Peterson, and Zhigang Hong	

<b>Two-Pore Domain K<sup>+</sup> Channels and Their Role in Chemoreception .....</b>	<b>15</b>
Keith J. Buckler	

<b>Intricate Interaction Between Store-Operated Calcium Entry and Calcium-Activated Chloride Channels in Pulmonary Artery Smooth Muscle Cells .....</b>	<b>31</b>
Abigail S. Forrest, Jeff E. Angermann, Rajesh Raghunathan, Catherine Lachendro, Iain A. Greenwood, and Normand Leblanc	

<b>The Role of Intracellular Ion Channels in Regulating Cytoplasmic Calcium in Pulmonary Arterial Smooth Muscle: Which Store and Where? .....</b>	<b>57</b>
A. Mark Evans	

<b>Ca<sup>2+</sup> Oscillations Regulate Contraction Of Intrapulmonary Smooth Muscle Cells .....</b>	<b>77</b>
Michael J. Sanderson, Yan Bai, and Jose Perez-Zoghbi	

## **Part II TRP Channels in the Pulmonary Vasculature: Basics and New Findings**

<b>Introduction to TRP Channels: Structure, Function, and Regulation .....</b>	<b>99</b>
Michael Y. Song and Jason X.-J. Yuan	

<b>Physiological Functions of Transient Receptor Potential Channels in Pulmonary Arterial Smooth Muscle Cells.....</b>	<b>109</b>
Xiao-Ru Yang, Mo-Jun Lin, and James S. K. Sham	
<b>The Contribution of TRPC1 and STIM1 to Capacitative Ca<sup>2+</sup> Entry in Pulmonary Artery .....</b>	<b>123</b>
Lih Chyuan Ng, Judith A. Airey, and Joseph R. Hume	
<b>Store-Operated Calcium Entry Channels in Pulmonary Endothelium: The Emerging Story of TRPCS and Orai1 .....</b>	<b>137</b>
Donna L. Cioffi, Christina Barry, and Troy Stevens	
<b>TRPM2 Channel Regulates Endothelial Barrier Function.....</b>	<b>155</b>
Claudie M. Hecquet, Gias U. Ahmmed, and Asrar B. Malik	
<b>Part III Pathogenic Role of Ion Channels in Pulmonary Vascular Disease</b>	
<b>A Proposed Mitochondrial–Metabolic Mechanism for Initiation and Maintenance of Pulmonary Arterial Hypertension in Fawn-Hooded Rats: The Warburg Model of Pulmonary Arterial Hypertension.....</b>	<b>171</b>
Jalees Rehman and Stephen L. Archer	
<b>The Role of Classical Transient Receptor Potential Channels in the Regulation of Hypoxic Pulmonary Vasoconstriction .....</b>	<b>187</b>
B. Fuchs, A. Dietrich, T. Gudermann, H. Kalwa, F. Grimminger, and N. Weissmann	
<b>Developmental Regulation of Oxygen Sensing and Ion Channels in the Pulmonary Vasculature.....</b>	<b>201</b>
David N. Cornfield	
<b>Hypoxic Regulation of Ion Channels and Transporters in Pulmonary Vascular Smooth Muscle.....</b>	<b>221</b>
Larissa A. Shimoda	
<b>CLC-3 Chloride Channels in the Pulmonary Vasculature.....</b>	<b>237</b>
Joseph R. Hume, Ge-Xin Wang, Jun Yamazaki, Lih Chyuan Ng, and Dayue Duan	

## **Part IV Receptors and Signaling Cascades in Pulmonary Arterial Hypertension**

<b>Role of Bone Morphogenetic Protein Receptors in the Development of Pulmonary Arterial Hypertension .....</b>	<b>251</b>
Nicholas W. Morrell	

<b>Cross Talk Between Smad, MAPK, and Actin in the Etiology of Pulmonary Arterial Hypertension .....</b>	<b>265</b>
James West	

<b>Notch Signaling in Pulmonary Hypertension .....</b>	<b>279</b>
Patricia A. Thistlethwaite, Xiaodong Li, and Xiaoxue Zhang	

<b>Rho Kinase-Mediated Vasoconstriction in Pulmonary Hypertension .....</b>	<b>299</b>
Ivan F. McMurtry, Kohtaro Abe, Hiroki Ota, Karen A. Fagan, and Masahiko Oka	

<b>The Serotonin Hypothesis of Pulmonary Hypertension Revisited .....</b>	<b>309</b>
Margaret R. MacLean and Yvonne Dempsie	

<b>Impaired Vascular Endothelial Growth Factor Signaling in the Pathogenesis of Neonatal Pulmonary Vascular Disease.....</b>	<b>323</b>
Steven H. Abman	

## **Part V Receptors and Transporters: Role in Cell Function and Hypoxic Pulmonary Vasoconstriction**

<b>Mitochondrial Regulation of Oxygen Sensing.....</b>	<b>339</b>
Navdeep S. Chandel	

<b>Reactive Oxygen Species and RhoA Signaling in Vascular Smooth Muscle: Role in Chronic Hypoxia-Induced Pulmonary Hypertension .....</b>	<b>355</b>
Thomas C. Resta, Brad R. S. Broughton, and Nikki L. Jernigan	

<b>Polyamine Regulatory Pathways as Pharmacologic Targets in Pulmonary Arterial Hypertension.....</b>	<b>375</b>
Mark N. Gillespie, and Jack W. Olson	

<b>5-HT Receptors and K<sub>v</sub> Channel Internalization .....</b>	<b>391</b>
Angel Cogolludo and Francisco Perez-Vizcaino	

## **Part VI Targeting Ion Channels and Membrane Receptors in Developing Novel Therapeutic Approaches for Pulmonary Vascular Disease**

<b>KCNQ Potassium Channels: New Targets for Pulmonary Vasodilator Drugs? .....</b>	<b>405</b>
Alison M. Gurney, Shreena Joshi, and Boris Manoury	
<b>Receptor Tyrosine Kinase Inhibitors in Rodent Pulmonary Hypertension .....</b>	<b>419</b>
Liliana Moreno-Vinasco and Joe G. N. Garcia	
<b>PDGF Receptor and its Antagonists: Role in Treatment of PAH.....</b>	<b>435</b>
Friedrich Grimminger and Ralph Theo Schermuly	
<b>PPAR<math>\gamma</math> and the Pathobiology of Pulmonary Arterial Hypertension .....</b>	<b>447</b>
Marlene Rabinovitch	
<b>Targeting TASK-1 Channels as a Therapeutic Approach.....</b>	<b>459</b>
Andrea Olschewski	
<b>Pharmacological Targets for Pulmonary Vascular Disease: Vasodilation versus Anti-Remodelling .....</b>	<b>475</b>
Matthew Thomas	
<b>Index.....</b>	<b>491</b>

Membrane Receptors, Channels and Transporters in  
Pulmonary Circulation

Yuan, J.X.-J.; Ward, J.P.T. (Eds.)

2010, XVI, 501 p., Hardcover

ISBN: 978-1-60761-499-9

A product of Humana Press