



ANNUAL REVIEW OF PHYSIOLOGY

VOLUME 59, 1997

JOSEPH F. HOFFMAN, *Editor*
Yale University School of Medicine

PAUL De WEER, *Associate Editor*
University of Pennsylvania School of Medicine



CONTENTS

PERSPECTIVES *Joseph F. Hoffman, Editor*

- Lung Surfactant: A Personal Perspective, *John A. Clements* 1

RESPIRATORY PHYSIOLOGY *Donald Massaro, Section Editor*

- O₂ Sensing Mechanisms in Excitable Cells: Role of Plasma Membrane K⁺ Channels, *Gabriel G. Haddad, Chun Jiang* 23

- The Pulmonary Lipofibroblast (Lipid Interstitial Cell) and Its Contribution to Alveolar Development, *Stephen E. McGowan, John S. Torday* 43

- Emerging Roles for Cysteine Proteases in Human Biology, *Harold A. Chapman, Richard J. Riese, Guo-Ping Shi* 63

- Cellular and Molecular Mechanisms of Pulmonary Vascular Remodeling, *K. R. Stenmark, R. P. Mecham* 89

CELL PHYSIOLOGY *Paul De Weer, Section Editor*

- Ion Channels in Vascular Endothelium, *Bernd Nilius, Felix Viana, Guy Droogmans* 145

- Inward Rectifier Potassium Channels, *C. G. Nichols, A. N. Lopatin* 171

- Cytoplasmic ATP-Dependent Regulation of Ion Transporters and Channels: Mechanisms and Messengers, *Donald W. Hilgemann* 193

GASTROINTESTINAL PHYSIOLOGY *David C. Dawson, Section Editor*

- Cholecystokinin Cells, *Roger A. Liddle* 221

- Physiology of Isolated Gastric Endocrine Cells, *George Sachs, Ningxin Zeng, Christian Prinz* 243

- Enteroglucagon, *J. J. Holst* 257

- The G Cell, *Mitsutaka Sawada, Chris J. Dickinson* 273

COMPARATIVE PHYSIOLOGY *George Somero, Section Editor*

- Evolution and Regulation of Urea Synthesis and Ureotely in (Batrachoidid) Fishes, *Patrick J. Walsh* 299

- The Chloride Cell: Structure and Function in the Gills of Freshwater Fishes, *Steve F. Perry* 325

ENDOCRINE PHYSIOLOGY <i>Jean D. Wilson, Section Editor</i>	
Regulation of Ovarian Follicle Atresia, <i>Antii Kaipia, Aaron J. W. Hsueh</i>	349
Specific, Nongenomic Actions of Steroid Hormones, <i>M. Wehling</i>	365
RENAL AND ELECTROLYTE PHYSIOLOGY <i>Robert J. Alpern, Section Editor</i>	
Biological Functions of Angiotensin and Its Receptors, <i>T. Matsusaka, I. Ichikawa</i>	395
Renal K ⁺ Channels: Structure and Function, <i>Wenhui Wang, Steven C. Hebert, Gerhard Giebisch</i>	413
Regulation of Gene Expression by Hypertonicity, <i>Maurice B. Burg, Eugene D. Kwon, Dietmar Kültz</i>	437
NEUROPHYSIOLOGY <i>Bruce P. Bean, Section Editor</i>	
Chemical Activators of Sensory Neurons, <i>John N. Wood, Reginald Docherty</i>	457
Control of M-Current, <i>Neil V. Marrion</i>	483
CARDIOVASCULAR PHYSIOLOGY <i>Christine Seidman, Section Editor</i>	
Endothelial Cell Regulation of Contractility of the Heart, <i>Saul Winegrad</i>	505
Spatial Relationships in Early Signaling Events of Flow-Mediated Endothelial Mechanotransduction, <i>Peter F. Davies, Kenneth A. Barbee, Natacha DePaola, Abdul I. Barakat, Michael V. Volin, Andre Robotewskyj, Jai Chen, Loren Joseph, Melvin L. Griem, Miles N. Wernick, Elizabeth Jacobs, Denise C. Polacek</i>	527
The Cellular and Molecular Response of Cardiac Myocytes to Mechanical Stress, <i>Junichi Sadoshima, Seigo Izumo</i>	551
SPECIAL TOPIC: MECHANOSensitivity <i>Owen P. Hamill, Special Topic Editor</i>	
Introduction: Molecular Mechanisms of Mechanotransduction, <i>Owen Hamill</i>	573
Tensegrity: The Architectural Basis of Cellular Mechanotransduction, <i>D. E. Ingber</i>	575
Osmoreceptors in the Central Nervous System, <i>Charles W. Bourque, Stéphane H. R. Oliet</i>	601
Induced Membrane Hypo-Hyper-Mechanosensitivity: A Limitation of Patch-Clamp Recording, <i>Owen P. Hamill, Don W. McBride, Jr.</i>	621

Mechanosensitive Channels of <i>Escherichia coli</i> : The MscL Gene, Protein, and Activities, <i>Sergei I. Sukharev, Paul Blount, Boris Martinac, Ching Kung</i>	633
Molecular Modeling of Mechanotransduction in the Nematode <i>Caenorhabditis elegans</i> , <i>Nektarios Tavernarakis, Monica Driscoll</i>	659
INDEXES	
Subject Index	691
Cumulative Index of Contributing Authors, Volumes 55-59	701
Cumulative Index of Chapter Titles, Volumes 55-59	704