

CONTENTS

FOREWORD	v
DEDICATION	vii
ACKNOWLEDGMENTS	ix

1. THE BALANCING ACT OF THE NAKED CELL: A BRIEF HISTORY OF MEMBRANE REGULATION OF ANIMAL CELL VOLUME BEFORE 1978	1
John S. Willis (Pre-Symposium Lecturer)	

ELECTRONEUTRAL COTRANSPORTERS

2. TWENTY-FIVE YEARS OF K-Cl COTRANSPORT: FROM STIMULATION BY A THIOL REACTION TO CLONING OF THE FULL-LENGTH KCCs	11
Peter K. Lauf and Norma C. Adragna	
3. MOLECULAR PHYSIOLOGY OF MAMMALIAN K^+ - Cl^- COTRANSPORTERS	29
Adriana Mercado, Gerardo Gamba, and David B. Mount	
4. STE20 KINASES AND CATION-CHLORIDE COTRANSPORTERS: A MINI REVIEW	43
Eric Delpire	
5. MOLECULAR PHYSIOLOGY OF THE RENAL Na^+ : Cl^- AND Na^+ : K^+ : $2Cl^-$ COTRANSPORTERS	55
Gerardo Gamba and Norma A. Bobadilla	



6. THE ROLE OF THE BLOOD-BRAIN BARRIER Na-K-Cl COTRANSPORTER IN STROKE: A Minireview	67
Martha E. O'Donnell, Tina I. Lam, Lien Tran and Steven E. Anderson	
7. REGULATION OF Na-K-2Cl COTRANSPORT IN RED CELLS	77
Peter Flatman	
8. A NOVEL NHE1 FROM RED BLOOD CELLS OF THE WINTER FLOUNDER: REGULATION BY MULTIPLE SIGNALING PATHWAYS	89
Stine F. Pedersen	
 ION CHANNELS AND EXCHANGERS	
9. PROBING OF THE ICln CHANNEL PORE BY CYSTEINE MUTAGENESIS AND CADMIUM-BLOCK	99
M. Jakab, M. L. Garavaglia, J. Fürst, S. Rodighiero, F. Guizzardi, G. Meyer, M. Ritter, and M. Paulmichl	
10. VOLUME-DEPENDENT AND -INDEPENDENT ACTIVATED ANION CONDUCTANCES AND THEIR INTERACTION IN THE RENAL INNER MEDULLARY COLLECTING DUCT (IMCD)	109
Stefan H. Boese, Mike A. Gray, and Nick L. Simmons	
11. SECRETORY CONTROL OF BASOLATERAL MEMBRANE POTASSIUM AND CHLORIDE CHANNELS IN COLONIC CRYPT CELLS	119
Dan R. Halm	
12. EFFECTS OF AMMONIUM ON ION CHANNELS AND TRANSPORTERS IN COLONIC SECRETORY CELLS	131
Roger T. Worrell and Jeffrey B. Matthews	
13. THE VOLUME-ACTIVATED CHLORIDE CURRENT DEPENDS ON PHOSPHOLIPASE C ACTIVATION AND INTRACELLULAR CALCIUM MOBILIZATION	141
D. Varela, F. Simon, A. Riveros, F. Jørgensen and A. Stutzin	
14. NITRIC OXIDE (NO) MODULATION OF CL-DEPENDENT TRANSPORTERS IN THE KIDNEY	147
Pablo A. Ortiz and Jeffrey L. Garvin	

- 15. VOLUME ACTIVATED ON CHANNEL AND ASTROCYTIC CELLULAR DEMA IN TRAUMATIC BRAIN INJURY AND STROKE..... 157**

Harold K. Kimelberg (Keynote Speaker)

CELL VOLUME, CYTOSKELETON AND APOPTOSIS

- 16. EFFECTORS AND SIGNALING EVENTS ACTIVATED BY CELL SHRINKAGE IN EHRlich ASCITES TUMOR CELLS: IMPLICATIONS FOR CELL PROLIFERATION AND PROGRAMMED CELL DEATH 169**

Else K. Hoffmann and Stine Falsig Pedersen

- 17. WATER MOVEMENT DURING APOPTOSIS: A ROLE FOR AQUAPORINS IN THE AVD 179**

Elizabeth Jablonski, Ashley Webb and Francis M. Hughes, Jr.

- 18. APOPTOSIS AND CELL VOLUME REGULATION: The importance of ions and ion channels 189**

Gerd Heimlich, Carl D. Bortner and John A. Cidlowski

- 19. ANION CHANNEL INVOLVED IN INDUCTION OF APOPTOSIS AND NECROSIS 205**

Yasunobu Okada, Emi Maeno, and Shin-ichiro Mori

- 20. ERYTHROCYTE ION CHANNELS IN REGULATION OF APOPTOSIS 211**

Florian Lang, Christina Birka, Svetlana Myssina, Karl S. Lang, Philipp A. Lang, Valerie Tanneur, Christophe Duranton, Thomas Wieder, and Stephan M. Huber

- 21. APOPTOSIS vs. ONCOSIS: ROLE OF CELL VOLUME AND INTRACELLULAR MONOVALENT CATIONS 219**

Sergei N. Orlov and Pavel Hamet

- 22. POLYCYSTIN-2 AS A SIGNAL TRANSDUCER 235**

H. F. Cantiello, N. Montalbetti, G. A. Timpanaro, and S. González-Perrett

- 23. FURTHER CHARACTERIZATION OF THE NEMATODE ICLNN2 PROTEIN RECONSTITUTED IN LIPID BILAYERS 245**

M. Ritter, C. Bertocchi, M. Jakab, J. Fürst, M. Paulmichl

**24. HYPERTONICITY-INDUCED CATION CHANNELS IN RAT
HEPATOCYTES AND THEIR INTRACELLULAR
REGULATION 253**

Frank Wehner and Heidrun Olsen

**25. CELL VOLUME SENSING AND REGULATION IN SKELETAL
MUSCLE CELLS: Lessons from an Invertebrate 263**

Hector Rasgado-Flores, Jillian Theobald, Susan Markowitz, Darryl Zlatnick,
Pei-Ang Yee, Pei-Ping Yee, Lauren Trais, Kathy Gohar, David Hergan,
Robert Buechler, Robert Lajvardi and Cecilia Pena-Rasgado

26. Q-VD-Oph, NEXT GENERATION CASPASE INHIBITOR 293

Thomas L. Brown

OSMOLYTE TRANSPORTERS AND SIGNALING

**27. ARE MEMBRANE TYROSINE KINASE RECEPTORS INVOLVED
IN OSMOTRANSDUCTION? 301**

H. Pasantes-Morales, R. Lezama and R. Franco

**28. GLIAL-NEURONAL SIGNALING AND ASTROGLIAL
SWELLING IN PHYSIOLOGY AND PATHOLOGY 313**

Elisabeth Hansson and Lars Rönnbäck

**29. CELL SWELLING-INDUCED PEPTIDE
HORMONE SECRETION 325**

Vladimir Strbák, Julius Benicky, Susan E. Greer, Zuzana Bacova,
Miroslava Najvirtova, and Monte A. Greer

30. VOLUME REGULATION OF THE HIPPOCAMPUS 331

James E. Olson and Norman R. Kreisman

**31. CELL VOLUME REGULATION IN INTESTINAL
EPITHELIAL CELLS 339**

Sebastian F.B. Tomassen, Hugo R. de Jonge and Ben C. Tilly

**32. REGULATION OF EPITHELIAL ELECTROLYTE
TRANSPORTERS THROUGH PROTEIN-PROTEIN
INTERACTIONS 349**

Carole M. Liedtke

33. THE ROLE OF THE PHOSPHOINOSITIDE PATHWAY IN HORMONAL REGULATION OF THE EPITHELIAL SODIUM CHANNEL	359
Bonnie L. Blazer-Yost and Charity Nofziger	
34. MODULATION OF VOLUME-SENSITIVE TAURINE RELEASE FROM NIH3T3 MOUSE FIBROBLASTS BY REACTIVE OXYGEN SPECIES	369
Ian H. Lambert	
35. HYPERTENSION IN K-CL COTRANSPORTER-3 KNOCKOUT MICE	379
Norma C. Adragna, Yanfang Chen, Eric Delpire, Peter K. Lauf and Mariana Morris	
ABSTRACTS	
36. PHYSIOLOGY AND PATHOPHYSIOLOGY OF THE ERYTHROCYTE GARDOS CHANNEL IN HEMATOLOGICAL DISEASES	387
Carlo Brugnara, Lucia De Franceschi, and Alicia Rivera	
37. SWELLING-ACTIVATED CALCIUM-DEPENDENT POTASSIUM CHANNELS IN AIRWAY EPITHELIAL CELLS	388
José M. Fernández-Fernández, Esther Vázquez, Maite Arniges, Muriel Nobles, Aoife Currid and Miguel A. Valverde	
38. KCNQ CHANNELS ARE SENSORS OF CELL VOLUME.....	389
Morten Grunnet, Thomas Jespersen, Nanna K. Jørgensen, Nanna MacAulay, Nicole Schmitt, Olaf Pongs, Henrik S. Jensen, Søren-Peter Olesen and Dan A. Klaerke	
39. MEMBRANE LOCALIZATION OF THE NEURONAL K-CL COTRANSPORTER (K-Cl COT, KCC2) IN RAT CEREBELLUM	390
Kenneth B.E. Gagnon, Peter K. Lauf, and Robert E.W. Fyffe	
40. K-Cl COTRANSPORT (K-Cl COT, KCC) ACTIVATION BY N-ETHYLMALIMIDE IN C6 GLIOMA CELLS	391
Kenneth B.E. Gagnon, Norma C. Adragna, Robert E.W. Fyffe, and Peter K. Lauf	
41. EXPRESSION OF PLASMA MEMBRANE Ca^{2+} ATPASE IN CRAYFISH DURING MOLTING	393
Y.P. Gao, M. Nade and M.G. Wheatly	

42. SALINITY AFFECTS CRAYFISH PMCA AND NCX EXPRESSION.....	396
Y.P. Gao and M.G. Wheatly	
43. CRAYFISH EPITHELIAL Ca^{2+} CHANNEL-LIKE GENE (ECAC)	398
Y.P. Gao and M.G. Wheatly	
44. MODULATION OF KCNQ4 CHANNELS BY CHANGES IN CELL VOLUME	401
Charlotte Hougaard, Dan A. Klaerke, Søren-Peter Olesen, Else K. Hoffmann, and Nanna K. Jorgensen	
45. PKA PHOSPHORYLATION OF SGK MODULATES ADH-STIMULATED Na^{+} TRANSPORT IN A6 MODEL RENAL CELLS	403
Nathan Kast, Nicola Perrotti and Bonnie L. Blazer-Yost	
46. CELL VOLUME MODIFIES AN ATP-SENSITIVE ANION CONDUCTANCE IN CULTURED HIPPOCAMPAL ASTROCYTES	405
Guangze Li and James E. Olson	
47. ADH-STIMULATED Na^{+} TRANSPORT: INTERACTION BETWEEN THE cAMP/PKA AND PHOSPHOINOSITIDE SIGNALING PATHWAYS	407
Charity Nofziger and Bonnie L. Blazer-Yost	
48. EFFECT OF ALDOSTERONE ON Na^{+} TRANSPORT IN A MODEL RENAL EPITHELIAL CELL LINE A proteomic approach	409
Puneet Souda, Frank Witzmann and Bonnie L. Blazer-Yost	
49. UPREGULATION OF NCX PROTEIN IN HEPATOPANCREAS AND ANTENNAL GLAND OF FRESHWATER CRAYFISH ASSOCIATED WITH ELEVATED Ca^{2+} FLUX.....	411
La'Tonia M. Stiner, Yongping Gao and Michele Wheatly	
SPECIAL MUSICAL CONTRIBUTION (SARABANDA) FOR PETER LAUF, MD	415
Hector Rasgado-Flores	
INDEX.....	427