

PAST PRESIDENTS

Dr. John S. Kingsley	1910-1922
Dr. Harold D. Senior	1922-1926
Dr. William Proctor	1926-1927
Dr. Hermon C. Bumpus	1927-1932
Dr. Warren H. Lewis	1932-1937
Dr. Ulrich Dahlgren	1937-1946
Dr. Dwight Minnich	1946-1950
Dr. William H. Cole	1950-1951
Dr. Homer W. Smith	1951-1960
Dr. Eli K. Marshall	1960-1964
Dr. Roy P. Forster	1964-1970
Dr. William L. Doyle	1970-1975
Dr. Jack D. Myers	1975-1978
Dr. Charles E. Wilde	1978-1979
Dr. Raymond Rappaport	1979-1981
Dr. Bodil Schmidt-Nielsen	1981-1985
Dr. Franklin H. Epstein	1985-1995

PAST DIRECTORS

Dr. Ulrich Dahlgren	1920-1926
Dr. Herbert V. Neal	1926-1931
Dr. William H. Cole	1931-1940
Dr. Roy P. Forster	1940-1947
Dr. J. Wendell Burger	1947-1950
Dr. Warner F. Sheldon	1950-1956
Dr. Raymond Rappaport	1956-1959
Dr. Alvin F. Rieck	1959-1964
Dr. William L. Doyle	1964-1967
Dr. Charles E. Wilde	1967-1970
Dr. H. Victor Murdaugh	1970-1975
Dr. Richard M. Hays	1975-1979
Dr. Leon Goldstein	1979-1983
Dr. David H. Evans	1983-1992
Dr. David C. Dawson	1992-

CHAIR OF BOARD

Dr. James L. Boyer	1995-
--------------------	-------

1995-1996 OFFICERS

Chair, Board of Trustees...	Dr. James L. Boyer
Vice Chair.....	Dr. Rolf K.H. Kinne
Director.....	Dr. David C. Dawson
Secretary.....	Dr. David W. Towle
Treasurer.....	Mr. Peter F. Reilly
Clerk.....	Nathaniel I. Fenton, Esq.

EXECUTIVE COMMITTEE

Dr. James L. Boyer, Chairman
Dr. Edward J. Benz
Dr. David C. Dawson, Ex Officio
Dr. Raymond A. Frizzell
Dr. Barbara Kent, Ex Officio
Dr. Rolf K.H. Kinne
Mrs. Edith Milbury

SCIENTIFIC ADVISORY COMMITTEE

Dr. David H. Evans, Chairman
Dr. Bliss Forbush, III, Co-Chair
Dr. James L. Boyer, Tox. Cntr
Liason
Dr. H. William Harris
Dr. John H. Henson
Dr. Gregg Kormanik
Dr. Martin Morad
Dr. Erik Swenson
Dr. David W. Towle

Administrative Director.....Dr. Barbara Kent

TRUSTEES

Class of 1996

Ian P. Callard, Ph.D.
Professor, Department of Biology
Boston University

James B. Claiborne, Ph.D.
Professor
Department of Biology
Georgia Southern Univ.

Thomas W. Clark, M.D.
Bass Harbor, Maine
and
Gwynedd, Pennsylvania

Samuel M. Felton
Southwest Harbor, Maine

Marilyn Hoffman
Boston, Massachusetts
and
Washington, D.C.

Bodil Schmidt-Nielsen, Ph.D.
Trenton, Maine
and
Gainesville, Florida

Patricio Silva, M.D.
Associate Professor of Medicine
Harvard Medical School;
Chief, Division of Nephrology
New England Deaconess Hospital

David W. Towle, Ph.D.
Foster G. McGaw Professor
Department of Biology
Lake Forest College

Class of 1998

James L. Boyer, M.D.
Professor of Medicine
Chief, Div. of Digestive Diseases
Yale University School of Medicine

Robert M. Dowben, M.D.
Adjunct Professor of Physiology,
Brown University; Consultant in
Neurology, Presbyterian Hospital,
Dallas, TX; Senior Consultant, Rhode
Island Hospital

John N. Forrest, Jr. M.D.
Professor, Dept. of Internal Medicine
Yale University School of Medicine

Raymond A. Frizzell, Ph.D.
Prof. and Chairman, Cell Biol/Phys.
Univ. Pittsburgh School of Medicine

Freddy Homburger, M.D.
President and Director
Bio-Research Institute, Inc.
Cambridge, Massachusetts

Rolf Kinne, M.D., Ph.D.
Director, Max-Planck Institut
für Molekulare Physiologie
Dortmund, Germany

Gregg Kormanik, Ph.D.
Professor and Chairman
Department of Biology
University of N.C. at Asheville

Class of 1999

Edward H. Benz, Jr., M.D.
William Osler Professor and Chair
Department of Medicine
Professor of Molecular Biology & Genetics
Johns Hopkins University School of Medicine

Thomas H. Maren, M.D.
Professor, Dept. of Pharmacology
University of Florida
College of Medicine

David C. Dawson, Ph.D.
Professor, Dept. of Physiology
University of Michigan Medical School

Mrs. Edith Milbury
Bar Harbor, Maine

Barbara Kent, Ph.D.
Administrative Director
Mount Desert Island Biological Lab

Raymond Rappaport, Ph.D.
Senior Research Scientist
Mount Desert Island Biological Lab

Mrs. Emily Leeser
Mount Desert, Maine
and
New York, New York

Mrs. Edith Rudolf
Mount Desert, Maine
and
New York, New York

S C I E N T I F I C P E R S O N N E L 1 9 9 5

Principal Investigator

Associates

Nazzareno Ballatori, Ph.D.
Associate Professor
Department of Environmental Medicine
Environmental Health Science Center
University of Rochester School of Medicine

A. Truong

Edward J. Benz, Jr., M.D.
Professor and Chairman
Department of Medicine
Johns Hopkins University School of Medicine

J. Appel
N. Yagoda

Nancy Berliner, M.D.
Associate Professor of Medicine and Genetics
Department of Internal Medicine/Hematology Section
Yale University School of Medicine

M. Mulvey
T. Wong

Marlies Betka, Ph.D.
Research Associate
Department of Biology
Boston University

James L. Boyer, M.D.
Professor of Medicine
Director, Liver Center
Chief, Division of Digestive Diseases
Yale University School of Medicine

A. Donald
C. Fletcher
D. Seward
C. Soroka, Ph.D.

Gloria V. Callard, Ph.D.
Professor, Department of Biology
Boston University

L. McClusky

Ian P. Callard, Ph.D.
Professor, Department of Biology
Boston University

O. Putz

Horacio F. Cantiello, D.V.M., Ph.D.
Asst. Professor of Medicine
Harvard Medical School
Assistant Biologist
Massachusetts General Hospital

R. Jackson
C. Jones
A. Prat

James B. Claiborne, Ph.D.
Professor, Department of Biology
Georgia Southern University

J. Campbell
L. Long

Lars Cleemann, Ph.D.
Assistant Professor of Pharmacology
Georgetown University

B. Arrue
J. Fan

Principal Investigator

Gary Conrad, Ph.D.
Professor, Division of Biology
Kansas State University

Elizabeth L. Crockett, Ph.D.
Assistant Professor
Biological Sciences
Ohio University

David C. Dawson, Ph.D.
Professor, Department of Physiology
University of Michigan Medical School

Franklin H. Epstein, M.D.
William Applebaum Professor of Medicine,
Harvard Medical School;
Director, Nephrology Division,
Beth Israel Hospital

David H. Evans, Ph.D.
Professor, Department of Zoology
University of Florida

Bliss Forbush III, Ph.D.
Professor of Cellular and
Molecular Physiology
Yale University School of Medicine

John N. Forrest, Jr., M.D.
Professor, Department of Internal Medicine
Yale University School of Medicine

Raymond A. Frizzell, Ph.D.
Prof. and Chairman, Dept. of Cell Biol/Phys.
Univ. of Pittsburgh School of Medicine

Leon Goldstein, Ph.D.
Professor and Chairman
Department of Physiology and Biophysics
Brown University

Associates

A. Conrad, Ph.D.
M. Janasek
N. Martinez

S. Vekasi
E. Wilkes

B. Chen
S. Cherukuri
O. Omulepu
J. Schafer

K. Spokes

M. Gunderson

R. Behnke
S. Houston
A. Pernack

S. Aller
S. Bhanot
G. Forrest
A. George
S. Kelmenson
R. Lehrich
C. Lubbe
L. Matthews
M. Ratner
P. Schwartz

A. Takahashi, Ph.D.
E. Dawson

A. Acosta
E. Davis-Amaral
M. Musch, Ph.D.
E. Wilson

Principal Investigator

H. William Harris, M.D., Ph.D.
Associate Professor, Dep. of Pediatrics
Harvard Medical School;
Director, Renal Research, Nephrology
The Children's Hospital of Boston

J.K. Haynes, Ph.D.
David Packard Professor and Chairman
Department of Biology
Morehouse College

John H. Henson, Ph.D.
Assistant Professor
Department of Biology
Dickinson College

Hartmut Hentschel, Ph.D.
Senior Scientist
Max-Planck Institut fuer Molekulare Physiologie
Dortmund, Germany

George W. Kidder III, Ph.D.
Professor
Department of Biological Sciences
Illinois State University

Rolf Kinne, M.D., Ph.D.
Director, Max-Planck Institut
fuer Molekulare Physiologie
Dortmund, Germany

Evamaria Kinne-Saffran, M.D., Ph.D.
Senior Investigator, Max-Planck Institut
fuer Molekulare Physiologie
Dortmund, Germany

Arnost Kleinzeller, M.D., Ph.D., D.Sc.
Professor Emeritus
Department of Physiology
University of Pennsylvania

Thomas J. Koob, Ph.D.
Section Chief - Skeletal Biology
Shriners Hospital for Crippled Children

Gregg A. Kormanik, Ph.D.
Professor and Chairman
Department of Biology
University of North Carolina at Asheville

Associates

D. Sanderlin

R. Mendola
C. Roesner

M. Elger, Ph.D.

P. Foster

C. Jette
A. Werner

A. Amstutz

S. Andrews
M. Koob-Edmunds
A. Summers
J. Trotter, Ph.D.

C. Harris

Principal Investigator

Thomas H. Maren, M.D.
Graduate Research Professor
Department of Pharmacology
University of Florida College of Medicine

James Maylie, Ph.D.
Associate Professor
Department of OB/GYN
Oregon Health Sciences University

Thomas J. McManus, M.D.
Professor, Dept. of Cell Biology
Duke University Medical Center

David S. Miller, Ph.D.
Research Physiologist
Laboratory of Cellular & Molecular Pharmacology
NIH/NIEHS

Martin Morad, Ph.D.
Professor, Department of Pharmacology
School of Medicine
Georgetown University Medical Center

Alison Morrison-Shetlar, Ph.D.
Professor, Biology Department
Georgia Southern University

Michael H. Nathanson, M.D., Ph.D.
Associate Professor of Medicine and Cell Biology
Liver Study Unit
Yale University School of Medicine

Carolyn R. Newton, Ph.D.
Associate Professor
Department of Biology
Kalamazoo College

Robert L. Preston, Ph.D.
Professor of Physiology
Department of Biological Sciences
Illinois State University

Raymond Rappaport, Ph.D.
Senior Research Scientist
Mount Desert Island Biological Laboratory

J. Larry Renfro, Ph.D.
Professor, Dept. of Physiology and Neurobiology
University of Connecticut

Associates

B. Taschner

N. Vogenthaler
L. Wood
S. Kim

L. Atherly

D. Harvey
B. Hughes
J. Monterrubio
Y. Suzuki, Ph.D.

D. Soto
B. Wolpin

K. Mariwalla

C. Collins
T. Gott
J. Sharp

Principal Investigator

Carol E. Semrad, Ph.D.
Asst. Professor of Clinical Medicine
College of Physicians and Surgeons;
Columbia University

Charles Sidman, Ph.D.
Professor
Dept. of Molecular Genetics, Biochem, and Microbiology
Univ. of Cincinnati College of Medicine

Patricio Silva, M.D.
Associate Professor, Dept. of Medicine,
Harvard Medical School;
Chief, Division of Nephrology
New England Deaconess Hosp., Joslin Diabetes Center

Richard J. Solomon, M.D.
Associate Professor of Medicine
Harvard Medical School;
Clinical Director, Division of Nephrology
New England Deaconess Hospital

Erik R. Swenson, M.D.
Associate Professor of Medicine
Pulmonary/Critical Care Division
University of Washington

David W. Towle, Ph.D.
Foster G. McGaw Professor
Department of Biology
Lake Forest College

Frances M. Van Dolah, Ph.D.
Research Biochemist and Asst. Professor
Charleston Laboratory;
U.S. National Marine Fisheries Service;
Marine Biomedical and Environmental Sciences;
Medical University of South Carolina

Rui Wang, M.D., Ph.D.
Assistant Professor
Department of Physiology
University of Montreal, Canada

Jose A. Zadunaisky, M.D., Ph.D.
Professor of Physiology and Biophysics
Professor of Experimental Ophthalmology
New York University Medical Center

Associates

J. Anderson
J. Rock
S. Faull
A. Wilson

R. Fraley
D. Gumbs
K. Mooney

S. Solomon

S. Vanderwerf

M. Rushton
J. Tilghman

T. Leighfield
L. Sugg

M. Branch
A. Doyle

M. Balla
D. Croft

1 9 9 5 S E M I N A R S

Morning Transport

- July 10 "CFTR: Searching for the Pore" David C. Dawson, Ph.D., University of Michigan Medical School; Director, MDIBL
- July 17 "An ATP-sensitive volume regulatory osmolyte channel" Ned Ballatori, Ph.D., University of Rochester School of Medicine
- July 24 "Stoichiometry of voltage-dependent K^+ -channel, min K" James Maylie, Ph.D., Oregon Health Sciences University
- July 31 "Heat-shock proteins" J. Larry Renfro, Ph.D., The University of Connecticut
- August 7 " Ca^{++} transport systems as evolutionary markers: In the beginning there was the Na^+/Ca^{++} exchanger" Martin Morad, Ph.D., Georgetown University Medical Center
- August 14 "Cloning of the C-type natriuretic hormone receptor from the shark rectal gland" John N. Forrest, Jr., M.D., Yale University School of Medicine
- August 21 "Role of cytoskeleton in CFTR regulation" Horacio F. Cantiello, D.V.M., Ph.D., Harvard Medical School; Massachusetts General Hospital

Noon

- June 30 and July 7 - MDIBL Principal Investigators presented a series of 5 minute talks to outline summer research plans
- July 21 "Mechanism of cholera toxin stimulation of chloride secretion" David Burleigh, Ph.D., Lecturer, University of London
- July 28 "The role of cholesterol in the thermal adaptation of plasma membranes from poikilotherms" Elizabeth Crockett, Ph.D., Ohio University
- "Pathways stimulating rectal gland chloride secretion" Kathrina Mooney, Oglethorpe University
- August 4 "Role of Ca channels in chromaffin cell secretion" Lars Cleemann, Ph.D., Georgetown University Medical Center
- "ATP receptors in skate hepatocytes" Michael H. Nathanson, M.D., Ph.D., Yale University School of Medicine

Evening

- July 5 "Endocrine disrupting environmental contaminants and embryos: Lessons from wildlife" Louis J. Guillette, Jr., Ph.D., University of Florida

- July 12 "Toxin production and growth regulation in marine 'Red Tide' dino-flagellates" Frances M. Van Dolah, Ph.D., Marine Biomedical and Environmental Sciences, Medical University of South Carolina
- July 19 THE FIFTH THOMAS H. MAREN LECTURE - "K channels and K secretion in the collecting duct" Lawrence G. Palmer, Ph.D., Cornell University Medical College, New York
- July 26 "Multiple site optical recording of electrical activity: Designer-built 2-dimensional hearts and a mammalian simple nervous system" Brian M. Salzberg, Ph.D., University of Pennsylvania School of Medicine
- August 2 THE FOURTH JOHN W. BOYLAN MEMORIAL LECTURE - "North American estuaries and coastal waters: Passageways to the future" Robert H. Boyle, M.A. (Yale University). Reporter, Staff Writer, Staff Correspondent, Sports Illustrated and Time, 1954-1960; Associate Editor, Senior Editor and Senior Writer, Sports Illustrated, 1960-1986; Special Contributor, SI, 1986-present.
- August 9 THE FIRST HELEN F. CSERR MEMORIAL LECTURE - "Downstream Interactors of MIS, Activin, and TGF- β Type I Receptor" Patricia K. Donahoe, M.D., Chief, Pediatric Surgery, Massachusetts General Hospital
- August 23 "Coordinate regulation of neutrophil secondary granule protein gene expression" Nancy Berliner, M.D., Yale University School of Medicine

Special Seminars

- June 22 "Living Fossils Around the World" Jennifer Rock, B.A., College of the Atlantic
- July 6 "Hemoglobin and hemocyanin expression: The effects of time and tides" Nora Terwilliger, Ph.D., Oregon Institute of Marine Biology
- August 3 All campus MDIBL ethics seminar - "Approaches to environmental ethics" Roger King, Ph.D., Department of Philosophy, University of Maine. Compulsory for all fellowship recipients.
- August 3 "Future Science: Scientists of Tomorrow at Work Today" Public seminar featuring presentations by local and national high school and college students participating in exciting hands-on research training programs at MDIBL and the Jackson Laboratory

STUDENTS' "BASIC" LECTURE SERIES

(Participation required by students who are recipients of fellowships/scholarships)

- June 27 "Actin reorganization in response to cell volume changes" Colleen Roesener, Dickinson College
- July 11 1) "MDIBL: the last 15 years"; 2) "Two unlikely endocrine tissues: The heart and the endotheliate lining of blood vessels" David H. Evans, Ph.D., University of Florida and Mark Gunderson, St. Olaf College

- July 18 "Transport in cell membranes of the eye and gill" Jose Zadunaisky, M.D., Ph.D., and David Croft, New York University Medical School
- July 25 "Evolution of life histories - what does physiology tell us?" Oliver Putz, Boston University
- August 1 "Renal excretion of toxic chemicals - How your kidney tells drugs & pollutants to piss-off!" David S. Miller, Ph.D., NIEHS
- August 8 "Ca⁺⁺ signaling in the skate liver: Experimental methods for the TV generation" Kavita Mariwalla, Yale University
- "Technician information session" Dave Opdyke, Ursinus College, and Justin Crouse, Wesleyan University
- August 14 "Cystic fibrosis: Mutations, mechanisms and models" David C. Dawson, Ph.D., University of Michigan Medical School; Director, MDIBL

Symposia

- August 10 The Second Annual Maine Symposium on Molecular Toxicology sponsored by the Maine Toxicology Institute/Eastern Maine Medical Center; Co-host, MDIBL Center for Membrane Toxicity Studies - "Cellular Defense Against Toxic Chemicals: Extrusion Via Specific Pumps and Transporters", Moderator, James L. Boyer, Director, Center for Membrane Toxicity Studies

"Overview: Glutathione S-Conjugate Transporters and Pumps" Ned Ballatori, Ph.D., University of Rochester School of Medicine

"Metalloregulation of an Arsenite (Antimonite)-Translocating ATPase" Barry P. Rosen, Ph.D., Wayne State University School of Medicine

"Structure/Function Studies on the Wilson and Menkes Disease P-Type ATPases" Jonathan D. Gitlin, M.D., Washington University School of Medicine

"MRP, An Alternative Cause of Multidrug Resistance" Roger G. Deeley, Ph.D., Cancer Research Laboratories, Queen's University

"Electrophysiology of P-Glycoprotein: The Missing Link?" Horacio Cantiello, D.V.M., Ph.D., Harvard University School of Medicine

"P-Glycoprotein Expression in Yeast" Philippe Gros, Ph.D., McGill University

THE FOURTEENTH WILLIAM B. KINTER MEMORIAL LECTURE - "Mechanism and Manipulation of the Multidrug Transporter" Michael Gottesman, M.D., Laboratory of Cell Biology, National Cancer Institute, NIH

- August 15-19, 1995 - AN INTERNATIONAL SYMPOSIUM HONORING HOMER W. SMITH ON THE 100TH ANNIVERSARY OF HIS BIRTH - "The Kidney: Structure and Function in Health and Disease"

1995 PUBLICATIONS

Ballatori, N., A.T. Truong, P.S. Jackson, K. Strange and J.L. Boyer. ATP depletion and inactivation of an ATP-sensitive taurine channel by classic ion channel blockers. Mol. Pharmacol. 48:472-476, 1995.

Burns, A., C. Roesener, J. Zmuda, R. Mendola, and J. Henson. Actin-based cortical flow: regulation by intracellular ionic conditions and involvement in cellular wound resealing. Molecular Biology of the Cell 6:20a, 1995.

Evans, D.H. The roles of natriuretic peptide hormones (NPs) in fish osmoregulation. In: Advances in Environmental and Comparative Physiology--Mechanisms of Systemic Regulation in Lower Vertebrates II: Acid-base Regulation, Ion Transfer and Metabolism. N. Heisler, ed. Springer-Verlag, Heidelberg, pp. 119-152, 1995.

Evans, D.H., M. Gunderson, and C. Cegelis. $ET\beta$ -type receptors mediate endothelin-stimulated contraction in the aortic vascular smooth muscle of the spiny dogfish shark, Squalus acanthias. J. Comp. Physiol. (in press, 1996).

Henson, J.H., S. Capuano, D. Nesbitt, D.N. Hager, S. Nundy, D.S. Miller, N. Ballatori and J.L. Boyer. Cytoskeletal organization in clusters of isolated polarized skate hepatocytes: Structural and functional evidence for microtubule-dependent transcytosis. J. Exp. Zool. 271:273-284, 1995.

Henson, J.H., D.G. Cole, M. Terasaki, D. Rashid, and J.M. Scholey. Immunolocalization of the heterotrimeric kinesin related protein KRP (85/95) to the mitotic apparatus of early sea urchin embryos. Developmental Biology 171:182-194, 1995.

Kidder, G.W. III, and A.A. McCoy. The electromyogram as a measure of heavy metal toxicity in fresh water and salt water mussels. (Bull. Environ. Contam. Toxicol., in press).

Kormanik, G.A. Maternal-fetal transfer of nitrogen in chondrichthians. In: Nitrogen Metabolism and Excretion. P. Walsh and P. Wright, eds. CRC Press, Boca Raton, FL, 1995.

Maylie, J. and M. Morad. Evaluation of T- and L-type Ca^{2+} currents in shark ventricular myocytes. Am. J. Physiol. H1695-H1704, 1995.

Miller, D.S., G. Fricker, J.H. Henson, D.N. Hager, S. Nundy, N. Ballatori, and J.L. Boyer. Active, microtubule-dependent secretion of a fluorescent bile salt derivative in skate hepatocyte clusters. American Journal of Physiology, in press.

Nathanson, M.H., K. Mariwalla, N. Ballatori, and J.L. Boyer. Effects of Hg^{2+} on cytosolic Ca^{2+} in isolated skate hepatocytes. Cell Calcium 18:429-439, 1995.

Nathanson, M.H. and K. Mariwalla. Characterization and function of ATP receptors on hepatocytes from the little skate, Raja erinacea. American Journal of Physiology: Regulatory, Integrative and Comparative Physiology, (in press).

Schramm, U., G. Fricker, R. Wenger, and D.S. Miller. p-Glycoprotein-mediated secretion of a fluorescent cyclosporin analogue by teleost renal proximal tubules. Am. J. Physiol. 268:F46-F52, 1995.

Toop, T., J.A. Donald, and D.H. Evans. Localisation and characteristics of natriuretic peptide receptors in the gills of the Atlantic hagfish, Myxine glutinosa (Agnatha). J. Exp. Biol. 198:117-126, 1995.

Toop, T., J.A. Donald, and D.H. Evans. Natriuretic peptide receptors in the kidney and the ventral and dorsal aortae of the Atlantic hagfish, Myxine glutinosa (Agnatha). J. Exp. Biol. 198:1875-1882, 1995.

AUTHOR INDEX

Acosta, Amaris29
 Abernethy, Darrell.....33
 Atherly, Luana.....67
 Au, Lisa.....43
 Branch, McErney.....85
 Berliner, Nancy.....90
 Ballatori, Nazzareno.....61,62
 Baum, Michelle.....31
 Behnke, Rachel.....24
 Betka, Marlies.....93,96
 Boyer, James.....37,61,62
 Brill, Susan.....24
 Brown, Edward.....31
 Callard, Gloria.....96
 Campbell, Jennifer.....48
 Cantiello, Horacio.....71,75
 Capuano, Stephanie.....1
 Chen, Beatrice.....15
 Cherukuri, Sudhakar.....15
 Claiborne, James B.....48
 Cleemann, Lars.....11,33
 Conrad, Abigail.....5,17
 Conrad, Gary.....5,17
 Crockett, Elizabeth.....83
 Croft, David59
 Davis-Amaral, Erin.....64,66
 Dawson, David.....15
 Donald, Alistair.....61,62,88
 Doyle, Alfred.....85
 Elger, Marlies.....28,31,40
 Epstein, Franklin.....35,36,37
 Evans, David.....94,95
 Fan, Jing.....11
 Fletcher, Christine.....62
 Forbush, Bliss.....24,26
 Forrest, John.....79
 Foster, Pamela.....92
 Fraley, Robin.....35,37
 Goldstein, Leon.....64,65,66
 Gunderson, Mark.....94,95
 Gumbs, Delaina.....35,37
 Harris, Cassandra.....50
 Harris, H. William.....31
 Harvey, Daggett.....7
 Haynes, John.....79
 Hebert, Stephen.....31
 Henson, John.....1
 Hentschel, Hartmut.....28,31,40
 Herter, P.....31
 Hoche, Amanda.....35
 Hughes, Barbara.....33
 Jackson, G. Robert.....71,75

Janasek, Mitchell.....5
 Jones, Carlin.....71
 Kaleta, Mary.....52
 Karten, H.....75
 Katsma, Keith.....52,55
 Keilstein, J.T.....108
 Kidder, George.....92
 Kinne, Rolf.....28
 Kohl, B.....28
 Koob, Thomas.....101,105,108
 Koob-Edmunds, Magdalena.....105
 Kormanik, Gregg.....50
 Lapetina, Graciana.....52,55
 Lehrich, Rudiger.....79
 Leighfield, Todd.....98
 Long, Layron.....48
 Maguire, Greg.....75
 Maren, Thomas.....45,47
 Mariwalla, Kavita.....69
 Martinez, Natalie.....5
 Mateescu, Mircea.....85
 Matthews, Jeffrey.....37
 Maylie, James.....7
 McCluskey, Leon.....96
 Mendola, Robert.....1
 Miller, David.....45,59,67,96
 Monterubio, Jose.....33
 Mooney, Kathrina.....35,37
 Morad, Martin.....7,11,33
 Morrison-Shetlar, Alison.....22
 Musch, Mark.....65,66
 Mulvey, Matthew.....90
 Nathanson, Michael.....62,69
 Newton, Carolyn.....19
 Omulepu, Osak.....15,79
 Pernak, Andrea.....26
 Prat, Adriana.....71
 Preston, Robert.....52,55
 Rappaport, Raymond.....4
 Rao, Mralina.....24
 Renfro, J. Larry.....28,45
 Roesener, Colleen.....1
 Sanderlin, Damien.....79
 Schafer, Jr., James.....15
 Semrad, Carol.....88
 Seward, David.....88
 Silva, Patricio.....35,36,37
 Simokat, Kristin.....52
 Solomon, Richard.....35,36,37
 Solomon, Samuel.....37
 Soto, Daniel.....22
 Spokes, Katherine.....35,36

Stea, Dino.....	85
Stolte, Hilmar.....	108
Sugg, Linda.....	98
Summers, Adam.....	108
Suzuki, Yuichiro.....	33
Swenson, Erik.....	45,47
Taschner, Brian.....	45,47
Tilghman, Judi.....	19
Towle, David.....	19
Trong, Anh.....	61
Trotter, John.....	108

Van Dolah, Frances.....	7,98
Vekasi, Sarah.....	83
Wang, Rui.....	85
Werner, Andrew.....	28
Wilkes, Erin.....	83
Wilson, Elizabeth.....	64
Wolpin, Brian.....	22
Wu, Lingyun.....	85
Zadunaisky, Jose.....	43,59
Zhang, Yi.....	85
Zimmerman, Paula.....	52,55

S P E C I E S I N D E X

<u>Anguilla rostrata</u> (American eel).....	83
<u>Callinectes sapidus</u> (Blue crab).....	19
<u>Cucumaria frondosa</u> (Orange-footed cucumber).....	105
<u>Echinarachnius parma</u> (sand dollar).....	1,4
<u>Fundulus heteroclitus</u> (killifish).....	31,40,43,45,67
<u>Gambierdiscus toxicus</u> (dinoflagellate).....	98
<u>Ilyanassa obsoleta</u> <u>Stimpson/Nassa-</u> <u>rius obsoletus</u> <u>Say</u> (marine mud snail).....	5,17
<u>Myoxocephalus octodecimspinosus</u> (long horned sculpin).....	48
<u>Mytilus edulis</u> (blue mussel).....	93

<u>Myxine glutinosa</u> (Atlantic hagfish).....	108
<u>Oncorhynchus mykiss</u> (Northwest trout).....	31
<u>Pseudopleuronectes americanus</u> (Winter flounder).....	28,31
<u>Raja erinacea</u> (little skate).....	31,36,61, 62,64,65,66,69,79,88,101,108
<u>Rattus norvegicus</u> (Norway rat).....	11,33
<u>Salmo gairdneri</u> (Rainbow trout).....	35
<u>Squalus acanthias</u> (spiny dogfish)....	7,22, 24,31,35,37,47,50,71,75,85,90,93,94,95,96
<u>Stongylocentrotus droebachiensis</u> (green sea urchin).....	1
<u>Xenopus</u> (African claw-toed frog).....	15

KEY WORD INDEX

Acetylcholine.....	95	Human.....	59
Amiloride.....	48	Hydrodynamics.....	108
Ammonia.....	50	Hydrogen peroxide.....	33
Ankyrin.....	65	Intestine.....	28
Apoptosis.....	96	Ion transport.....	24
ATP, β , γ methylene.....	35	Kidney.....	28, 40, 45
Bending tests.....	105	Kidney magnesium secretion.....	31
Benzmetanide.....	24	Kinesin.....	1
Bicarbonate.....	45	Maitotoxin.....	7
C-type natriuretic peptide.....	36	Membrane proteins.....	66
Cadmium.....	88, 93, 94	Mercury.....	15, 69
Calcium.....	33	Metabolic alkalosis.....	45
Calcium polycation receptor protein.....	31	Metabolic fuel preference.....	83
Cardiac muscle.....	33	Metalloproteinase.....	90
Carbonic anhydrase.....	45, 47	Metallothionein.....	93
Catecholamines.....	11	Microtubules.....	1
Cation channel.....	7	Mutable connective tissue.....	105
Cell volume.....	64, 65	Myocytes.....	85
Ceruplasmin.....	85	Myosin.....	17
Chromaffin cells.....	11	Na^+/H^+ exchange.....	48
Cl^- transport.....	64	Na-K-Cl cotransporter.....	24, 26
Cleavage furrow.....	4	Nitric Oxide.....	94
Confocal microscopy.....	69	Nitrogen.....	50
Contractile ring.....	4	Notochord.....	108
Copper.....	85	Oocyte.....	15
Copper ion (Cu^{2+}).....	5	Organic anion transport.....	59, 67
Cortex.....	4	Osmolyte channel.....	61
Cytoskeleton.....	65	Polymerase chain reaction.....	90
Dermis.....	105	Potassium channel.....	15
Egg capsule.....	108	Prostaglandin.....	94
Electromyograph.....	92	Proximal tubule.....	40
Electron microscopy.....	40	Purinoceptor.....	69
Embryos.....	50	Pyridoxal.....	66
Endothelin.....	95	Quinidine.....	52, 55
Endothelium.....	94	Rectal gland.....	24
Erythrocytes.....	64	Red blood cells.....	52, 55
Euryhaline.....	45	Renal.....	22
Eye.....	59	Renal proximal tubule.....	67
Fish.....	45	Salinity adaptation.....	31
Fluorescence microscopy.....	59, 67	Salinity acclimation.....	83
Force production.....	4	Saltwater adaptation.....	26
Forskolin.....	35, 36	Scyliorhinin II.....	36
Gene expression.....	90	Secretion.....	11
Gill.....	45, 83	Silver ion (Ag^+).....	5
Gill regulation.....	48	Sodium.....	22
Glucose.....	22	Sodium-phosphate-cotransport.....	1
Heart.....	7, 17	Sodium-potassium antiporter.....	17
Heavy metals.....	92	Spermatogenesis.....	93, 96

Taurine transport.....52,55,69
 Tensile properties.....108
 Sulfhydryl cross-linking.....5
 Survival.....92
 Swelling properties.....105
 Taurine channel.....61

Testis.....96
 Theophylline, 8-cyclopentyl.....35
 Urinary acidification.....45
 Vanadate.....67
 Vascular smooth muscle.....94,95
 Volume regulation.....61