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David W. Barnes, Ph.D. Investigator and Director Marine Cell Lines and Stem Cell Program Mount Desert Island Biological Laboratory	Lori Dowell Angela Parton Jason Rafferty
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Section Chief, Skeletal Biology
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Michael Rosenstein

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Thomas Pannabecker, Ph.D. Research Assistant Professor Department of Physiology College of Medicine University of Arizona	
Chris Petersen, Ph.D. Professor of Biology College of the Atlantic	Jason Childers Nina Therkildsen Santiago Salinas
Antonio Planchart, Ph.D. Investigator MDI Biological Laboratory Assistant Professor College of the Atlantic	
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John. R. Riordan, Ph.D. Professor Mayo Clinic Scottsdale	

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Richard Stockton College

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Leonard I. Zon, M.D.
Professor of Pediatrics
Children's Hospital
Harvard Medical School
Investigator, Howard Hughes Medical Institute

Wolfram Goessling, M.D., Ph.D.
Gerhard Weber, M.D.

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High School Research Fellowship:	**Mentors:**
Lucien Bisson, Carrabassett Valley Academy	Celine Spanings-Pierrot, Ph.D.
Julie Burns, MDI High School	JB Claiborne, Ph.D.
Emily Hand, MDI High School	Andrea Tilden, Ph.D.
Dylan Perry, Carrabassett Valley Academy	Markus Frederich, Ph.D.
Alexander Peters, Rye Country Day School	John N. Forrest, Jr., M.D.
Amanda Shorette, Winslow High School	Andrea Tilden, Ph.D.

NIEHS CMTS Community Environmental Health Laboratory:

Michelle Brown, MDI High School	Jane Disney, Ph.D.
Jonathan Hollenbeck, MDI High School	
Kendra Richard, MDI High School	
Sarah Winnie, Conners-Emerson School	

Secondary Education through Health:

Ciara Clarke, Environmental Sciences HS	J. Denry Sato, D.Phil.
Carlan McDonald, Health Sciences Careers HS	Barbara Beltz, Ph.D.

American Heart Association Fellowship

Jiang Ling Wang, Thomas Jefferson High School	Martin Morad, Ph.D.

UNDERGRADUATE FELLOWSHIP RECIPIENTS

NIEHS CTMS Community Environmental Health Laboratory:

Nicole Grohoski, Middlebury College	Jane Disney, Ph.D.
Orrin Johnson, Bard College	

NSF Research Experience for Undergraduates (REU):

Nora Beltz, Colby College	John N. Forrest, Jr., M.D.
Kentrell Burks, Morehouse College	John N. Forrest, Jr., M.D.
Julia Curtis-Burnes, Wellesley College	J.B. Claiborne, Ph.D.
Maria Genco, Wellesley College	Barbara Beltz, Ph.D.
Helen Gonzalez, William Patterson University	Edward Benz, M.D.
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Marisa Litz, The University of Maine	Petra Lenz, Ph.D.
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Jason Rafferty, Bates College	David Barnes, Ph.D.
Katherine Smith, University of New Hampshire	Raymond Henry, Ph.D.
Renee Thibodeau, Whitman College	Bruce Stanton, Ph.D.
Andrea Topete, University of Texas – El Paso	David Barnes, Ph.D.

NIH/NCRR Maine Biomedical Research Infrastructure Network (BRIN-ME):

Emma Apatu, University of Maine - Machias	Touradj Solouki, Ph.D. The University of Maine
Kelly Baehre, Bates College	David Towle, Ph.D. and Petra Lenz, Ph.D.
Ellen Beth, Bowdoin College	Richmond Thompson, Ph.D. Bowdoin College
Jeremy Charette, The University of Maine	Carol Kim, Ph.D. The University of Maine
Erica Cyr, Bates College	Patsy Nishina, Ph.D. The Jackson Laboratory
Lydia Durant, Colby College	Bruce Stanton, Ph.D.
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Pieter Scheerlinck, Bowdoin College	Patsy Dickinson, Ph.D. Bowdoin College
Marisa Litz, The University of Maine	Petra Lenz, Ph.D.

NSF Collaborative Research at Undergraduate Institutions (CRUI):

Jamie Baldwin, Illinois State University	
Jason Childers, College of the Atlantic	*all students mentored by:*
Michael Gille, Illinois State University	George Kidder, Ph.D.
Kevin Kocot, Illinois State University	Chris Peterson, Ph.D.
Daniel Richmond, Illinois State University	Robert L. Preston, Ph.D.
Santiago Salinas, College of the Atlantic	
Lauren Sliga, Illinois State University	
Nina Therkildsen, College of the Atlantic	

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Laurel Parker, University of Maine	Susan Fellner, Ph.D.

Stanley Bradley and Stan and Judy Fellowships:

Chris Sighinolfi, University of Pennsylvania	Franklin Epstein, M.D.

Leonard Silk Fellowship

Eduarta Kapinova, College of the Atlantic	David Evans, Ph.D. and Shawn Holt, Ph.D.

2004 SEMINARS

Seminars preceded by an asterisk were presented by investigators supported by the NIEHS Center for Membrane Toxicity Studies at the Mount Desert Island Biological Laboratory

Morning Membrane Transport Seminars

July 5 "Control of ionic transport across the killifish opercular epithelium" William S. Marshall, Ph.D., Professor and Chair, Department of Biology, St. Francis Xavier University

July 12 "Paracrine control of fish gill function" David H. Evans, Ph.D., Professor and Chair, Department of Zoology, University of Florida

*July 19 "Discovery of a key sterol transporter: from the fish to the human genes" Ned Ballatori, Ph.D., Professor, Department Environmental Medicine, University of Rochester School of Medicine

July 26 "Neuroendocrine control of salinity-mediated carbonic anhydrase induction in the gills of the euryhaline green crab, *Carcinus maenas*" Raymond Henry, Ph.D., Professor of Biology, Department of Biological Sciences, Auburn University

August 2 "Ins and outs of the epithelial sodium channel, ENaC" Raymond Frizzell, Ph.D., Professor and Chair, Department of Cell Biology and Physiology, University of Pittsburgh School of Medicine

August 9 "The Na-K-Cl cotransporter and the enigma of PASK" Biff Forbush, Ph.D., Professor, Department of Cellular and Molecular Physiology, Yale University School of Medicine

August 16 "The Amazing Heart: Where the heart stops, the brain begins!" Martin Morad, Ph.D., Professor of Pharmacology and Medicine, Department of Pharmacology, Georgetown University Medical Center

August 23 "Modes of stimulation of Cl^- secretion in shark rectal gland" Franklin H. Epstein, M.D., William Applebaum Professor of Medicine, Harvard Medical School; Beth Israel Deaconess Medical Center

Friday Noon Brown Bag Seminars

July 9 Introductory 5 minute talks by MDIBL Principal Investigators to summarize summer research projects

July 16 Introductory 5 minute talks by MDIBL Principal Investigators to summarize summer research projects

July 23 Introductory 5 minute talks by MDIBL Principal Investigators to summarize summer research projects

July 30 "Hypotonicity-induced exocytosis of the skate anion exchanger sKAE1: Role of lipid raft regions" Leon Goldstein, Ph.D., Professor/Vice-Chair, Department of Molecular Pharmacology, Physiology and Biotechnology, Brown University

August 6 Introductory 5 minute talks by MDIBL Principal Investigators at the Lab in August to summarize summer research projects

Wednesday Evening Public Seminars

*July 7 THE TENTH HELEN F. CSERR MEMORIAL LECTURE - "Prolactin: The forgotten hormone of breast cancer" Barbara K. Vonderhaar, Ph.D., Chief, Mammary Biology/Tumorigenesis Lab; Chair, Breast Cancer Faculty, Center for Cancer Research, NCI/NIH

*July 15 THE TWENTY-SECOND WILLIAM B. KINTER MEMORIAL LECTURESHIP – "Comparative genome sequencing: Using evolution to decode the human genome" Eric D. Green, M.D., Ph.D., Scientific Director, National Human Genome Research Institute (NHGRI), NIH

*July 28 THE ELEVENTH JOHN W. BOYLAN MEMORIAL LECTURE – "Aquaporin Water Channels – Nature's Plumbing System." Peter Agre, M.D., Professor, Department of Biological Chemistry, Johns Hopkins University School of Medicine; Recipient, 2003 Nobel Prize in Chemistry

August 4 THE NINTH LEONARD SILK MEMORIAL LECTURE – "How Financial Conflicts of Interest Endanger our Profession" Jerome Kassirer, M.D., Professor of Medicine, Tufts University School of Medicine

*August 18 THE FOURTEENTH ANNUAL THOMAS H. MAREN MEMORIAL SEMINAR – "A Role for Carbonic Anhydrase in renal Sulfate Excretion" J. Larry Renfro, Ph.D., Professor of Physiology & Neurobiology, The University of Connecticut

Special Seminars and Presentations

May 17 "Mutations in Serac1 and Synj2 correlate with abnormal sperm structure and function" Antonio Planchart, Ph.D., Faculty, Lecturer in Biological Chemistry, Bates College; Junior Faculty, Maine Biomedical Research Infrastructure Network

*July 13 "Origin of vertebrate adaptive immunity" Zeev Pancer, Ph.D., Research Associate, University of Alabama-Birmingham

July 27 "Potassium channels and urinary bladder function" Georgi Petkov, Ph.D., Research Assistant Professor, Department of Pharmacology, University of Vermont

*August 17 "Physiogenomic control of cell fate during sea urchin embryogenesis" James A. Coffman, Ph.D., Assistant Investigator, Stowers Institute for Medical Research

August 20 THE JESSICA H. LEWIS NATURAL SCIENCES LECTURE – "Climate change facts: *What do we know? Where are we heading?*" James McCarthy, Ph.D., Alexander Agassiz Professor of Biological Oceanography, Harvard University

August 26 "Examination of the Early Steps of Mast Cell Signaling" Julie Gosse, Chemistry Ph.D. Program, Department of Biophysical Chemistry, Cornell University

*August 27 "Membrane dynamics in neuronal synapse formation and Alzheimer's disease." Shasta Sabo, Ph.D., Postdoctoral Fellow, Center for Neuroscience, University of California-Davis

2004 CONFERENCES, SYMPOSIA AND WORKSHOPS

April 30-May 1 31st MAINE BIOLOGICAL AND MEDICAL SCIENCES SYMPOSIUM co-hosted by The Mount Desert Island Biological Laboratory and The Jackson Laboratory with support from the Maine Biological Research Infrastructure Network NCRR NIH

Friday, April 30

Symposium welcome and introduction: **Patricia Hand,** Ph.D., Administrative Director, MDIBL Introduction, **Sharon Crook**, Ph.D., Assistant Professor of Mathematics, The University of Maine

"Neural coding of sensory information: Lessons learned from a simple sensory system" Keynote Speaker: **Gwen Jacobs**, Ph.D., Associate Professor of Neuroscience, Montana State University

SESSION I: *Functional Genomics* (David Towle, Ph.D., Chair)

*"Functional Genomics of Cystic Fibrosis" **Bruce Stanton**, Ph.D., Professor of Physiology, MDIBL and Dartmouth Medical School

"Synj2$^{\Delta Sac1}$: a novel, membrane-associated isoform of the Synj2 phosphatidylinositol polyphosphate 5-phosphatase in mouse brain and testis" **Antonio Planchart**, Ph.D., Lecturer, Biological Chemistry, Bates College

"TWIST homo and heterodymers dynamically regulate gene expression in the cranial sutures" **Jeannette Connerney**, Ph.D. Student, Maine Medical Center Research Institute

"Cloning of potential palmitoyltransferase genes in dictyostelium" **Bethany Bodwell**, Undergraduate Student, The University of Maine

"Functional Annotation of the Mouse Genome: A Phenotype-driven Approach" **Luanne Peters**, Ph.D., Staff Scientist, The Jackson Laboratory

"The integration of thrombin, FGF and NOTCH signaling leads to clonal stem cell self-renewal" **Joseph Verdi**, Ph.D., Director, Center for Regenerative Medicine, MMCRI

*"Identification of 5,000 expressed genes in a normalized cDNA library from the American Lobster, Homarus americanus" **David Towle**, Ph.D., Senior Scientist, MDI Biological Laboratory

"Comparative analyis of post-transcriptional gene regulation during early development of mouse and zebrafish" **Joel Graber**, Ph.D., Associate Staff Scientist, The Jackson Laboratory

"Building a genomic regulatory network for lung development" **Kevin Peterson**, Ph.D. student, UMaine and The Jackson Laboratory

*"Spatial-temporal analysis of microarray findings in a mouse model of mammary cancer" **Karen Fancher**, Ph.D. student, UMaine and The Jackson Laboratory

SESSION IIA: *Marine and Freshwater Biology* (Paul Collodi, Chair)

*"Germ-line competent zebrafish ES cell cultures for targeted mutagenesis" **Paul Collodi**, Ph.D., Professor of Animal Sciences, MDIBL and Purdue University

"Shark and skate cell culture systems: Derivation and characterization of proliferating cell cultures from multiple tissues" **Angela Parton**, Research Assistant, Marine Cell Lines and Stem Cell Program, MDI Biological Laboratory

*"Metallothionein's role in female-specific zinc sequestration in squirrelfish" **Greg Mayer**, Ph.D., Assistant Professor, Molecular/Environmental Toxicology, The University of Maine

"Characterization of viral infection in zebrafish (*danio rerio*) with snakehead rhabdovirus" **Peter Phelan**, Graduate Student, Biochemistry, Microbiology, Molecular Biology, The University of Maine

POSTER SESSION – Dahlgren Hall

Saturday, May 1

SESSION IIB: *Marine and Freshwater Biology* (Barbara Kent, Chair)
*"Elasmobranchs as models in biomedical research" **Carl Luer**, Ph.D., Senior Scientist, Mote Marine Laboratory

"Marine microfilamentous green algae: New lineages in the ulotrichales/ulvales complex (*ulvophyceae*)" **Charles O'Kelly**, Ph.D., Senior Research Scientist, Bigelow Marine Laboratory

"Inhibition of steroidogenesis by a unique lymphomyeloid tissue in the little skate, *Raja erinacea"* **Bram Lutton**, Ph.D. Student, MDIBL and Boston University

"A nudibranch mucus inhibits nematocyst discharge and changes with prey type" **Paul Greenwood**, Ph.D., Associate Professor of Biology, Colby College

SESSION III: *Workshop* (Gwen Jacobs, Ph.D., Facilitator)

"The IDeANet Project: Information Networks in Biomedical Research" **Gwen Jacobs**, Ph.D., Principal Investigator, The Lariat Project, Western IDeANet Project
Available for Q&A session:* Gerry Dube, Director, UNET, The University of Maine System*

SESSION IV: *Physiology and Human Health* (Barbara Kent, Ph.D., Chair)

"Tom Maciag's Life and Work" **Robert Friesel,** Ph.D., Director, Center for Molecular Medicine, MMCRI

"Role of Microdevices in Medicine and Biology" **Scott Collins**, Ph.D., Laboratory for Surface Science and Technology, The University of Maine

"The effects of proctolin on gastric-pyloric interactions in the lobster *Homarus americanus*" **Chris Johnson**, Undergraduate Student, Bowdoin College

*"Adjusting the estimated proportion of breast cancer cases associated with BRCA1 and BRCA2 mutations: Public health implications" **Monica McClain**, Ph.D., Associate Director, Biometry and Epidemiology, Foundation for Blood Research

*"Aryl hydrocarbon receptor and cardiac beta-adrenergic receptor signaling" **Rebecca Sommer**, Ph.D., Assistant Professor of Biology and Environmental Studies, Bates College

"Heart failure associated with diabetes" **Amy Davidoff**, Ph.D., Associate Professor, College of Osteopathic Medicine, University of New England

"Patterning the developing gastrointestinal tract" **Nicole Theodosiou**, Ph.D., Assistant Research Professor of Biology, Bowdoin College

"Development and applications of a respiratory burst assay for zebrafish" **Andrea Hermann**, Graduate Student, Graduate Student, Biochemistry, Microbiology, Molecular Biology, The University of Maine

*"αB-crystallin and HSPB2, two small heat shock proteins, have distinct physiological functions in the mouse heart" **Ilka Pinz**, Ph.D., Assistant Professor, University of New England

***July 15-16 Eleventh Annual Mount Desert Island Biological Laboratory (MDIBL) Environmental Health Sciences Symposium** - Sponsored by the National Institute of Environmental Health Sciences (NIEHS) Center at the MDIBL, the National Center for Research Resources, the Yale University Liver Center, the Kinter Memorial Lectureship Fund, and the MDIBL

"Insights from Comparative Genomic and Toxicogenomic Analyses"

Thursday, July 15

22nd Annual William B. Kinter Memorial Lecture: "Comparative Genome Sequencing: Using Evolution to Decode the Human Genome" Keynote speaker, **Eric D. Green,** M.D., Ph.D., National Human Genome Research Institute (NHGRI)

POSTER SESSION – Dahlgren Hall

Friday, July 16

Welcome, **John Forrest, M.D.**, Director of MDIBL, Yale University School of Medicine

SESSION I. ***Comparative I: Discovery of Genes, Functions and Regulatory Mechanisms***

"Evolution and assembly of scrambled genes: Comparative and laboratory studies" **Laura F. Landweber**, Ph.D., Princeton University

"Comparative sequence-based discovery of functional elements" **Inna Dubchak**, Ph.D., Lawrence Berkley National Laboratory

"Genes lost and genes found" **Howard Ochman,** Ph.D., University of Arizona

"Genomics of symbiotic bacteria in insects" **Nancy Moran,** Ph.D., University of Arizona

SESSION II. *Comparative II: Genomic Adaptations to Environmental Challenges*

"Expanding principles of genome evolution: insights from microbial eukaryotes" **Laura A. Katz**, Ph.D., Smith College

"Variation in gene expression within and among natural populations" **Margie Oleksiak**, Ph.D., NC State University

"Systems biology of host-pathogen-environment interactions" **Bruno Sobral**, Ph.D., Virginia Bioinformatics Institute

"Pathogenomics: Host-pathogen interactions and the evolution of virulence" **Fiona Brinkman**, Ph.D., Simon Fraser University

SESSION III. *Biological Resources*
"The comparative toxicogenomic database" **Carolyn Mattingly**, Ph.D., MDI Biological Laboratory, Salisbury Cove, Maine

"Insights into eukaryotic genome evolution through analysis of orthologous gene clusters" **Igor B. Rogozin**, Ph.D., National Center for Biotechnology Information (NCBI)

"Connecting sequence and biology in the laboratory mouse" **Carol Bult**, Ph.D., Informatics Department, The Jackson Laboratory

"Chemical Effects in Biological Systems (CEBS) Knowledge Base" **Michael D. Waters**, Ph.D., National Institute of Environmental Health Sciences

"EDGE2: An open resource for profiling the transcriptional response to chemicals and induced mutations" **Christopher Bradfield**, Ph.D., University of Wisconsin-Madison

"PharmGKB: The Pharmacogenetics and Pharmacogenomics Knowledge Base" **Caroline Thorn**, Ph.D., Stanford University School of Medicine

July 26 **Frenchman's Bay Crustacean Association – 2nd Summer Symposium: Crustacean Research at MDIBL**

Welcome: David W. Towle, Ph.D., MDIBL

Keynote Address: "Blue babies and soft shells: Metamorphosis and molting in megalopas" **Nora B. Terwilliger** (Oregon Institute of Marine Biology)

"Limits for the distribution of decapod crustaceans in polar areas: Critical temperatures and magnesium regulation" **Markus Frederich** (University of New England)

"Gill area, permeability, and Na,K-ATPase activity as a function of size and salinity in the blue crab, *Callinectes sapidus*" **Robert Roer**, Tiandao Li, Matthew Vana, Susan Pate, and Jennifer Check (University of North Carolina at Wilmington)

"Crustacean hyperglycemic hormone isoforms in the shore crab *Pachygrapsus marmoratus* adapted to low salinity" **Céline Spanings-Pierrot** (Université Montpellier II), Lucien Bisson (Carrabassett Valley Academy), and David W. Towle (MDIBL)

"Sequencing ionic transporters in the crab *Pachygrapsus* marmoratus using Genome Walker and RACE-PCR techniques" **Nishad Jayasundara** (College of the Atlantic), Céline Spanings-Pierrot (Université Montpellier II), and David W. Towle (MDIBL)

"Occurrence and function of L- and D-crustacean hyperglycemic hormone isoforms in the crayfish *Astacus leptodactylus*" **Laetitia Serrano**, Guy Charmantier, and Céline Spanings-Pierrot (Université Montpellier II)

"Further studies on the effects and characteristics of a putative carbonic anhydrase repressor in the eyestalk of the euryhaline green crab, *Carcinus maenas*" **Raymond P. Henry** (Auburn University) and David W. Towle (MDIBL)

"Further studies on the carbonic anhydrase repressor carried in the hemolymph of the green crab, *Carcinus maenas"* **Katie Smith** (University of New Hampshire), Raymond P. Henry (Auburn University) and David W. Towle (MDIBL)

"Electrophysiological study of copepod developmental stages" **Kevin R. Funk** and Daniel K. Hartline (University of Hawai'i)

"Metabolic responses in the copepod *Acartia hudsonica* to red-tide dinoflagellates" **Pat Hassett** and Lisa Crockett (Ohio University)

*"Thermal stress response in marine copepods" Maria Voznesensky (Northwestern University), **Petra H. Lenz** (University of Hawai'i), Céline Spanings-Pierrot (Université Montpellier II), and David W. Towle (MDIBL)

*"Expression levels of a heat shock protein (hsp70) mRNA in *Calanus finmarchicus*" **Kelly Baehre** (Bates College), Petra H. Lenz (University of Hawai'i) and David W. Towle (MDIBL)

"Time, tide and neurogenesis: Do Crabs Care?" **Barbara Beltz**, Jeanne Benton, Maria Genco, David Sandeman, Jeremy Sullivan (Wellesley College), and Michael Mellon (University of Virginia)

"Time, tide and neurogenesis: Cellular controls?" **David Sandeman** and Barbara Beltz (Wellesley College)

"Melatonin and biological rhythms in intertidal crustaceans" **Andrea Tilden**, Cat Downing, Rharaka Gilbert, Jocelyn LeBlanc, Eric Luth (Colby College), Emily Hand (University of Richmond), and Amanda Shorette (Winslow High School)

"Expressed sequence tags in a normalized cDNA library of the American lobster *Homarus americanus*" **David W. Towle** and Christine M. Smith (MDIBL)

Posters

"Escape responses in developmental stages of calanoid copepods" **Marisa N. Litz** (University of Maine) and Daniel Burdick (University of Hawai'i)

"Immunohistochemical studies of copepod nervous systems" **Daniel Burdick** (University of Hawai'i) and Barbara Beltz (Wellesley College)

August 5 2004 MDIBL Student Symposium

Welcome and Introduction, Michael McKernan, Director of Education

"How I spent my summer vacation: Tales of tides, time, and neurogenesis" Maria Genco, Wellesley College (REU)

"Retinal electrophysiology and neurite elongation studies in *Uca pugilator*" Eric Luth, Jocelyn LeBlanc (BRIN), Catherine Downing, Rharaka Gilbert, Colby College, Emily Hand (HCS), MDI High School, and Amanda Shorette (HSRF), Winslow High School

"Sequencing cDNA encoding the killifish serine/threonine kinase SGK" Ciara Clarke, High School for Environmental Studies (SETH)

*"The affects of arsenic toxicity on CFTR and MRP-2 expression in *Fundulus heteroclitus*" Lydia Durant, Colby College (BRIN) and Renee Thibodeau, Whitman College (REU)

"Derivation and manipulation of cell culture systems of the dogfish shark (*Squalus acanthius*) and the green spotted puffer fish (*Tetraodon nigroviridis*)" Andrea Topete, University of Texas – El Paso (REU)

"The hunt for the potassium channel" Nora Beltz, Colby College (REU), Kentrell Burks, Morehouse College (REU), Kate Kelley, Skidmore College (REU), and Alex Peters, Princeton University (HSRF)

"Escape responses in developmental stages of calanoid copepods" Marisa Litz, University of Maine (REU and BRIN)

"CEHL: *Enterococcus* explodes, *Alexandria* amass, cruise ship crises" Community Environmental Health Laboratory, MDIBL and MDIWQC (CMTS)

*"Uptake of phallotoxin into liver cells" Fabienne Meier-Abt, Cambridge University (REU)

***August 13-15 Mount Desert Island Stem Cell Symposium**
Co-hosted by The Mount Desert Island Biological Laboratory and The Jackson Laboratory with support from the Maine IDeA Network for Biomedical Research Excellence, National Institute for Diabetes & Digestive & Kidney Diseases, National Center for Research Resources, NIH

Friday, August 13

SESSION I: *Workshop: Current topics in fish development and stem cell research** (Leonard Zon, MD, Chair)
*This workshop will focus on many topics from fish technology development, comparative

genomics, transplantation, genetics, and biology. Talks do not necessarily relate directly to stem cells.

Welcome and Introduction to the Workshop, **Leonard Zon, MD**, Harvard Medical School; Howard Hughes Medical Institute/Children's Hospital, and MDIBL

"Maternal control of vertebrate development: mutant studies from the zebrafish" **Mary Mullins, PhD**, University of Pennsylvania

"Genome duplication in teleosts: A tool for analysis of gene function" **John Postlethwait, PhD**, University of Oregon

"Genetic mapping in Xiphophorus fishes" **Steve Kazianis, PhD**, The Wistar Institute, Philadelphia, PA

"Functional Genomics Tools for the Zebrafish" **Steve Ekker, PhD**, University of Minnesota Medical School

Leonard Zon, MD, HHMI/Children's Hospital, Boston

"Pax3 functions at a nodal point in adult neural crest stem cell differentiation" **Jonathan Epstein, MD**, Univ. Pennsylvania SOM

"Assembly of vascular networks during development: Lessons learned from zebrafish" **Brant Weinstein, PhD**, NIH/NICHHD

"Developmental Growth Control of the Fin Ray Segment Cycle" **Stephen Johnson, PhD**, Washington University Medical School

"Understanding telomeres and telomerase in marine organisms" **Shawn Holt, PhD**, Medical College of Virginia at VCU and MDIBL

SESSION II: *Advances in Mammalian Stem Cell Research* (John N. Forrest, Jr., MD, Chair)
Welcome and Introduction to the Symposium, **John N. Forrest, Jr., MD**, Director, MDI Biological Laboratory

"What is a stem cell?" **Davor Solter, MD**, The Jackson Laboratory

"Nuclear cloning, stem cells and reprogramming of the genome" **Rudolph Jaenisch, MD**, Whitehead Institute, MIT

"Are embryonic stem cells merely tissue culture artifacts?" **James Thomson, PhD**, University of Wisconsin

"Molecular mechanisms of stem cell control" **Stuart Orkin, MD**, HHMI/Harvard Medical School

"Intra-arterial delivery of mouse muscle derived progenitor cells" **Louis Kunkel, PhD**, Children's Hospital, Harvard Medical School

Saturday, August 14

SESSION II, cont: *Advances in Mammalian Stem Cell Research* (Barbara Knowles, PhD, Chair)

Ronald McKay, PhD, NIH

"Mechanisms of Fate Determination in CNS Stem Cells" **David Anderson, PhD**, HHMI/Cal Tech

"Identification and origin of stem cells in the adult CNS" **Arturo Alvarez-Bullya, PhD**, UCSF

"Reprogramming development by nuclear transfer" **Allan Trounson, PhD**, Monash

"Systems thinking about stem cell systems" **Ihor Lemischka, PhD**, Princeton

"Genetics of embryonic stem cells" **Andras Nagy, PhD**, Mt. Sinai Hospital, Toronto

"Transdetermination of endodermal progenitor cells in response to hyperactivity of the canonical WNT signaling pathway" **Brigid Hogan, PhD**, Duke University

SESSION III: *Comparative models in development and Organogenesis* (Paul Collodi, PhD, Chair)

"DNA Repair in Stem and Differentiating Mouse Spermatogenic Cells" **Christi Walter, PhD**, Univ. Texas Health Science Center

"The forkhead transcription factor Foxl1 remains bound to condensed mitotic chromosomes and stably remodels hetrochromatin structure during early organogenesis" **Shawn Burgess, PhD**, NHGRI/NIH

"Genetic and cellular approaches to the study of spermatogenic stem cells" **Mary Ann Handel, PhD**, The Jackson Laboratory

"Age Dependent Changes in Mutation Frequencies and Mutation Spectra in Differentiating Mouse Spermatogenic Cells" **Ron Walter, PhD**, Texas State University – San Marcos

"Mediators of cholesterol metabolism and germ cell migration" **Steve Farber, PhD**, Kimmel Cancer Center, Thomas Jefferson Univ.

"Endodermal organ morphogenesis in zebrafish" **Didier Stanier, PhD**, Univ. California – San Francisco

"Perturbation of Heart Development, Vasculogenesis and Hematopoiesis by E-Peptide of Pro-IGF-I in Fish Embryos by Transgenesis" **Thomas Chen, PhD**, University of Connecticut

"Replacement tooth formation in zebrafish: A model for human replacement tooth therapies" **Pamela Yelick, PhD**, The Forsyth Institute, Harvard School of Dental Medicine

EVENING PROGRAM
Panel Discussion (open to the public) "Current Implications of Stem Cell Research and Human Health" **Leonard Zon, MD**, and **Louis Kunkel, PhD**

Sunday, August 15

SESSION III, con't: *Comparative models in development and Organogenesis* (Jonathan Epstein, MD, Chair)

"The emerging genetics of T-cell acute lymphoblastic leukemia: a fish tale" **Thomas Look, MD**, Dana Farber Cancer Institute

"Immortal and mortal clonal lymphoid cell lines from channel catfish (*Ictalurus punctatus*)" **L. William Clem, PhD**, University of Mississippi Medical Center

"Stem Cell Biology of the Colonial Protochordate, *Botryllus schlosseri*" **Tony de Tomaso, PhD**, Stanford University

"Persistent neurogenesis in the teleost retina" **Peter Hitchcock, PhD**, University of Michigan

"Muller glia: are they adult retinal stem cells?" **Pamela Raymond, PhD**, University of Michigan

"Patterning the zebrafish nervous system" **Marnie Halpern, PhD**, Carnegie Institute of Washington

"Wnt/ß-catenin regulation of zebrafish tail development and regeneration" **Randall Moon, PhD**, HHMI/University of Washington

"Progress towards development of an ES cell-mediated gene targeting approach in zebrafish" **Paul Collodi, PhD**, Purdue University

Final Comments, **David Barnes, PhD**, MDI Biological Laboratory

2004 COURSES

Jan. 12-23	Advanced Molecular Neurobiology Colby and Bowdoin Colleges BRIN Short Course David Towle, Ph.D., MDIBL, Course Director
*Mar. 1-12	Functional Genomics of Membrane Transport The University of Maine BRIN Short Course Denry Sato, Ph.D., MDIBL, Course Director
*May 3-14	Functional Genomics and Bioinformatics Bates College BRIN Field Experience David Towle, Ph.D., MDIBL, Course Director
May 15-30	Community Ecology of Coastal Maine Washington College Martin Connaughton, Ph.D., Washington College, Course Director
May 24-June 4	Physiology of Marine and Maritime Organisms Illinois State University and College of the Atlantic CRUI George Kidder, Ph.D., MDIBL; Robert Preston, Ph.D., Illinois State University; Chris Petersen, Ph.D., College of the Atlantic, Course Directors
May 31-June 6	Structure and Function of Polarized Epithelial Cells University of Pittsburgh School of Medicine, Intensive Laboratory Research Experience Raymond Frizzell, Ph.D. and Mark Zeidel, M.D., Univ. of Pittsburgh School of Medicine and MDIBL, Course Directors
*June 7-13	Structure and Function of Polarized Epithelial Cells Yale University School of Medicine, Intensive Laboratory Research Experience John N. Forrest, Jr., M.D., Yale Univ. School of Medicine and MDIBL, Course Director
*June 13-20	Sixth Annual Intensive Course in Quantitative Fluorescent Microscopy Simon C. Watkins, Ph.D., University of Pittsburgh School of Medicine, Course Director
June 21-23	Marine Physiology and Molecular Biology Research training course for high school interns Course Director - Jim Stidham, Ph.D., Presbyterian College and MDIBL
Nov. 29-Dec. 10	Molecular Biology Research Techniques College of the Atlantic INBRE Short Course David Towle, Ph.D., MDIBL, Course Director

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AUTHORS

SPECIES

KEY WORDS

RESEARCH SUPPORT