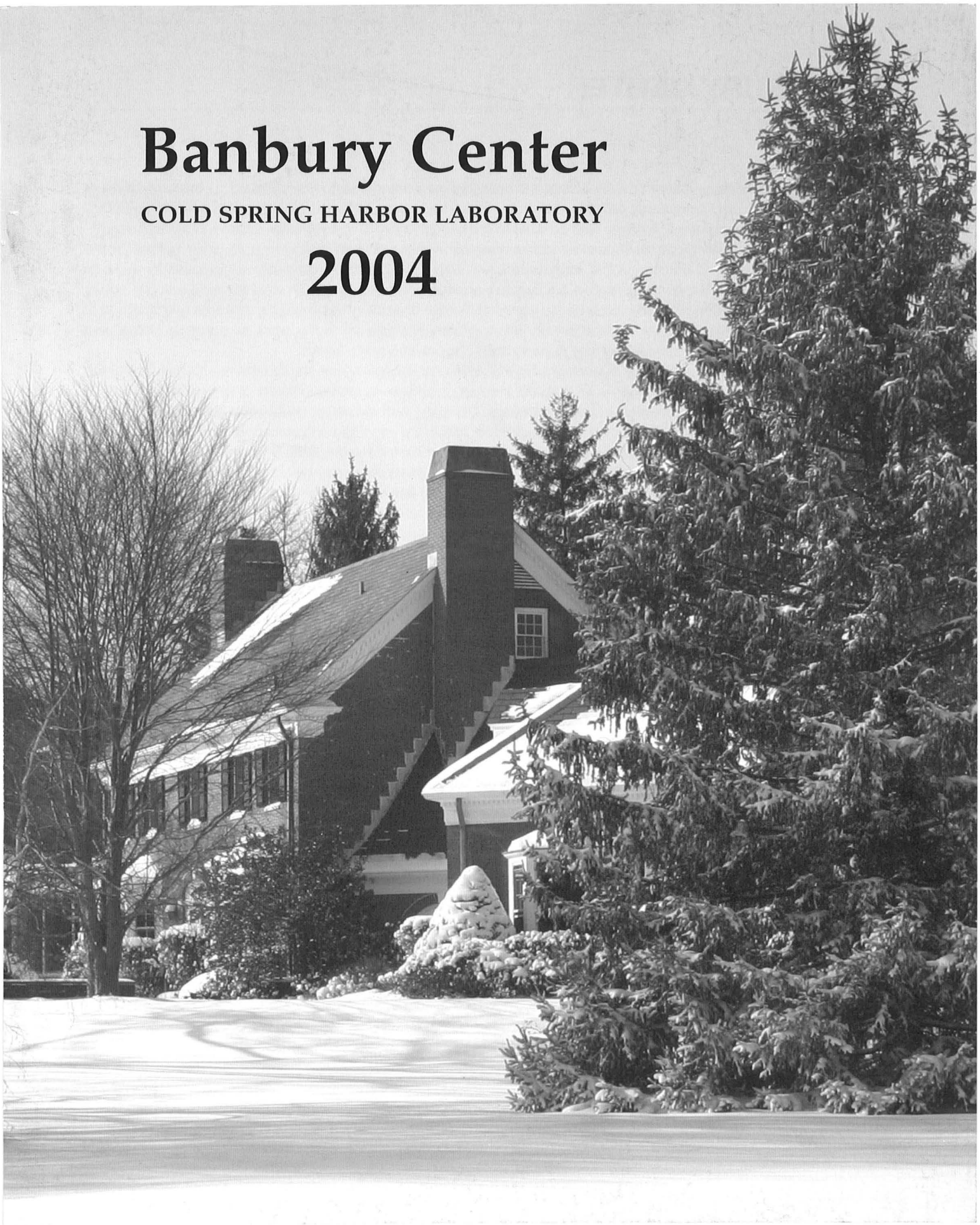
Banbury Center

COLD SPRING HARBOR LABORATORY

2004



BANBURY CENTER

Banbury Center is a 50-acre estate adjoining the waters of Long Island Sound on the north shore of Long Island, barely 40 miles east of downtown Manhattan and some five miles from Cold Spring Harbor Laboratory. The estate was donated to the Laboratory in 1976 by Charles Sammis Robertson together with funds for necessary architectural conversions and an endowment to cover upkeep of the grounds and the original estate structures. With the Laboratory's international reputation for research and education, the magnificent Banbury grounds and buildings are an ideal site for a complementary program of smaller conferences concentrating on aspects of the biological sciences which also bear significant social implications. Banbury's primary interests are in the areas of molecular biology and genetics, especially as they relate to health, social, and policy issues.

What was once the estate's original seven-car garage is now the Conference Center, containing administrative offices, a small library, and—at its center—a conference room of an ideal shape and size for workshop-style discussion meetings. Complete with extensive, unobtrusive sound and projection facilities as well as wall-to-wall blackboard space, the room can accommodate as many as 40 participants while remaining equally conducive to either formal presentations or informal give-and-take.

The Robertsons' family house, situated on the final promontory before the grounds descend to the shore of the harbor, now serves as the center for participant accommodations and dining, while the extensive grounds, swimming pool, tennis court, and beach present ample recreational resources. On-site accommodations were supplemented by the opening in 1981 of the Sammis Hall guest house—a modern embodiment of the sixteenth century Palladian villas—designed for the Center by the architectural firm of Moore Grover Harper. In 1997, the Meier House, opposite the Conference Center, was added to provide extra housing so that everyone attending a Banbury Center meeting can stay on the estate.

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BANBURY CENTER DIRECTOR'S REPORT

Banbury Center continues to be a thriving setting for specialized, focused meetings on pressing and emerging topics in biomedical research. In 2004, there were 18 meetings at Banbury Center, with 568 invited participants; 80% of the latter came from the United States, representing 38 states. As usual, New York, California, Maryland, and Massachusetts contributed the most. Foreign scientists came to Banbury from 21 countries. The Center continues to be used intensively all year round except during the depths of winter. In addition to the regular program of meetings, the Watson School of Biological Sciences held two week-long *Topics in Biology* courses, and there were five lecture courses in the Laboratory's summer neuroscience program. Two local groups also made use of the Center.

The 2004 Banbury Center program again explored a variety of topics, ranging from discussions on genetic disorders to exploratory meetings on theoretical biology. This year also marked a significant increase in meetings related to neurobiology, a shift that mirrors the Laboratory's expanding programs on brain development and disease. In March, the Center hosted a meeting on the severe neuromuscular disorder: spinal muscular atrophy. The meeting—*Spinal Muscular Atrophy: What Is the Molecular Basis of Neuron Loss?*—organized by Adrian Krainer (Cold Spring Harbor Laboratory), Alex MacKenzie (Children's Hospital of Eastern Ontario), and Kenneth Fischbeck (National Institute of Neurological Disease and Stroke) and reviewed the molecular pathology of this disorder. We continued our examination of Fragile X syndrome with the fifth meeting in a series on that disorder, *New Pharmacological and Neurobiological Approaches to the Treatment of Fragile X*, organized by Will Spooren (F. Hoffman-La Roche) and William Greenough (University of Illinois at Urbana-Champaign). It is remarkable to follow the way in which these meetings have moved from covering basic research to reviewing possible therapies. *T-type Calcium Channels: Their Role in Normal and Pathological CNS Function*, organized by Rodolfo Llinas (New York University Medical Center) and Ed Perez-Reyes (University of Virginia), went from the molecular biology of these channels to their roles in epilepsy, pain, and manic depression, whereas *Communication in Brain Systems*, organized by Terry Sejnowski (The Salk Institute for Biological Studies), dealt much more with theoretical issues, using modeling approaches to understand the structure and engineering of the brain. A fascinating and ambitious meeting, *Origins and Evolution of the Nervous System*, was organized by Ian Meinertzhagen (Dalhousie University, Halifax, Nova Scotia) and Volker Hartenstein (University of California, Los Angeles). Participants reviewed "simple" organisms to see how the morphology, organization, and functioning of their nervous systems change with the differing behavioral requirements of each organism. Although some organisms were familiar to Banbury—*Escherichia coli, Caenorhabditis elegans*, and *Drosophila*—others, including sponges, jellyfish, Ascidians, and planarians, made their first appearance at a Banbury Center meeting.

Another parallel to current Laboratory research was our meeting in August on RNAi (RNA interference). One remarkable thing about RNAi is that it provides a tool for the experimental manipulation of gene expression and we are also continuing to discover that it has a key role in cellular function. *RNAi-related Processes in Plants: Chromatin, Development, and Defense*, organized by James Carrington (Oregon State University), Steve Jacobson (University of California, Los Angeles), and Detlef Weigel (Max-Planck Institute for Developmental Biology), reviewed the ways in which plants use RNAi in their everyday life. The timing was just right—participants were able to hear first-hand from Leemor Joshua-Tor and Greg Hannon about their latest studies on Dicer, published a few weeks earlier in the journal *Science*.

Robertson House, the former family residence

Issues of bioterrorism continue to raise great concerns. The Department of Homeland Security funded *Microbial Forensics*, a follow-up meeting to one held in 2003. Organized by Bruce Budowle (Federal Bureau of Investigation Laboratory), Steven Schutzer (UMDNJ–New Jersey Medical School), and James Burans (U.S.

Meier House provides housing accommodations for participants at Banbury Center

Department of Homeland Security), participants discussed issues relating to novel infectious diseases affecting humans, agriculturally important animals, and crop plants. In addition to technical discussions about new methods for the rapid identification of pathogens, there were reviews of gaps in procedures and what the first steps should be to ensure that these gaps are filled. Infectious diseases of a different kind were also explored at the annual meeting sponsored by the Albert B. Sabin Vaccine Institute—*Pandemic Disease Threat: Can We Develop a Global Vaccine Policy?*—which was organized by Lewis A. Miller (Intermedia, Inc.), Dean D. Mason, and Veronica Korn (both from the Albert B. Sabin Vaccine Institute). Vaccination remains the most effective and most cost-effective way to prevent infectious diseases, and yet there is probably less attention currently paid to developing and distributing vaccines than at any previous time.

As in many other institutes around the world, genome-based genetics research is a major Laboratory focus and the major focus of meetings at Banbury. There are great expectations that the intricacies of genetic mutations will be elucidated using genomic tools, and some of these were included in *Breast Cancer Research: A Critical Review for Future Strategies*. Bruce Stillman (Cold Spring Harbor Laboratory) and Joe Sambrook (Peter MacCallum Cancer Institute) organized this small but intense meeting, which had a strong international cast. Understanding what a DNA sequence means continues to be a major theoretical and experimental challenge. *Finding the Functional Elements of the Genome*, organized by Ewan Birney (European Bioinformatics Institute), Aravinda Chakravarti (Johns Hopkins University School of Medicine), Lincoln Stein (Cold Spring Harbor Laboratory), and Richard Young (Whitehead Institute for Biomedical Research), covered topics ranging from comparative genomics to using experimental techniques to find transcriptional regulatory elements. One of the most exciting areas of genetics research is in epigenetics—those changes in genetic information that do not affect the DNA sequence itself yet can be inherited. But there are problems in deciding how to integrate epigenetic data in DNA sequence databases. *Bioinformatic Strategies for the Epigenome* organized by Denise P. Barlow (Center of Molecular Medicine GmbH of the Osterreichische Akademie der Wissenschaften) and Robert Martienssen (Cold Spring Harbor Laboratory) tackled how this might be done.

There is an increasing emphasis on theoretical and mathematical modeling approaches for ordering and understanding biological data. *Integrating Disparate Data to Simulate Lymphocyte Function*, organized by Suzanne Vernon and William C. Reeves (Centers for Disease Control and Prevention), examined whether there is sufficient information about the functions of lymphocytes, and their interactions with other cells, to model their behavior during infection. Talks included such recondite ones as "Application of probabilistic inference and machine learning to lymphocyte function."

Banbury Center has had a continuing interest in promoting genetics education. We held such meetings for science journalists and Congressional staff in conjunction with the Dolan DNA Learning Center and planned meetings on genetics education for nurses. A similar meeting, *Summit Meeting on Genetic Training*, held in 2004, was organized by Bruce Korf (University of Alabama, Birmingham). Participants included representatives from the key professional associations involved with genetics and genetic counseling. They came to review the current state of genetic teaching to physicians and other healthcare professionals, and to discuss what might be done to give genetics training a higher profile in medical education.

The success of the Banbury Center depends on many people. Bea Toliver, Ellie Sidorenko, and Katya Davey make sure that the meetings run properly, and Chris McEvoy and Joe Ellis keep the estate looking beautiful. The audiovisual staff, housekeeping, and the meetings office work closely with us as the Laboratory's meetings programs expand. And, of course, the Center could not work at all without the enthusiasm of organizers and participants.

Jan A. Witkowski
Executive Director

Spinal Muscular Atrophy: What Is the Molecular Basis of Neuron Loss?

March 7–10

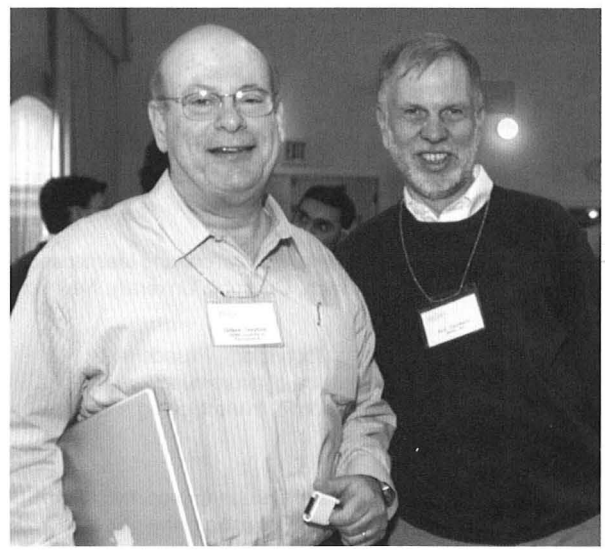
FUNDED BY **Spinal Muscular Atrophy Foundation**

ARRANGED BY **K.H. Fischbeck,** National Institute of Neurological Disorders and Stroke, NIH
A. Krainer, Cold Spring Harbor Laboratory
A. MacKenzie, Children's Hospital of Eastern Ontario

Introduction and Welcome: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
D. Singh, Spinal Muscular Atrophy Foundation, New York
A. MacKenzie, Children's Hospital of Eastern Ontario, Ottawa, Canada

SESSION 1: The Path to SMA Therapeutics: The Big Picture
Chairperson: S.C. Landis, National Institute of Neurological Disorders and Stroke, NIH, Bethesda, Maryland: NINDS mission

J. Heemskerk, National Institute of Neurological Disorders and Stroke, NIH, Bethesda, Maryland: The SMA project: Therapeutics development at NINDS.



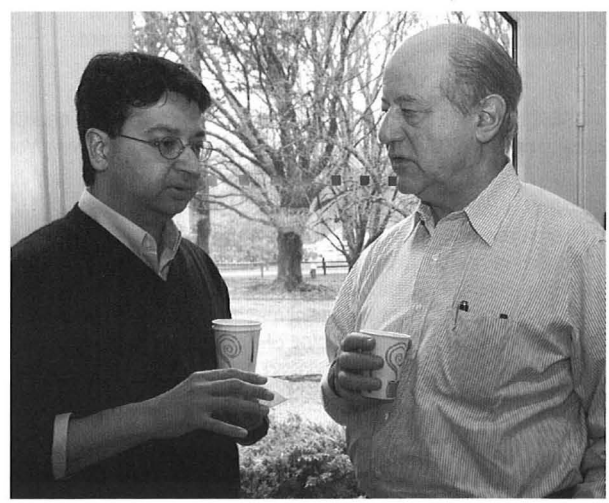
G. Dreyfuss, K. Fischbeck

SESSION 2: Animal Models of Motor Neuron Disease I
Chairperson: S.C. Landis, National Institutes of Health/ NINDS, Bethesda, Maryland

C.E. Beattie, The Ohio State University, Columbus: Motor neuron development in a zebrafish model of SMA.
T.M. Jessell, Columbia University, New York: Motor neuron ontogeny.
A.H.M. Burghes, Ohio State University, Columbus: SMA mice: When and where SMN corrects of phenotype.
J. Melki, INSERM, Evry, France: Mouse models of SMA: Valuable tools to evaluate pathophysiology and to design therapeutic strategies.

SESSION 3: Animal Models of Motor Neuron Disease II
Chairperson: A.H.M. Burghes, Ohio State University, Columbus

C.J. DiDonato, Children's Memorial Institute for Education & Research, Chicago, Illinois: How to evaluate in vivo testing of drugs in animal models.
G.A. Cox, The Jackson Laboratory, Bar Harbor, Maine: Transgenic rescue of motor neuron disease in the *nmd* mouse model of SMARD1.
A.M. Schaefer, Washington University School of Medicine, St. Louis, Missouri: Motor axon pruning and growth in a mouse model of ALS: In vivo studies.
E. Holzbaur, University of Pennsylvania, Philadelphia: Axonal transport defects in motor neuron degeneration.



D. Singh, G. Fischbach

SESSION 4: SMN Splicing, Function, and Cellular Sublocalization I
Chairperson: A.H.M. Burghes, Ohio State University, Columbus

A. Krainer, Cold Spring Harbor Laboratory: Determinants of exon 7 inclusion in SMN1/SMN2.

SESSION 5: SMN Splicing, Function, and Cellular Sublocalization II
Chairperson: K.H. Fischbeck, National Institute of Neurological Disorders and Stroke, NIH, Bethesda, Maryland

G. Dreyfuss, HHMI/University of Pennsylvania School of Medicine, Philadelphia: Functions of SMN.
U. Fischer, University of Wuerzburg, Germany: Analysis of the cellular function of SMN: Implications for spinal muscular atrophy.
G.J. Bassell, Albert Einstein College, Bronx, New York: Active transport of the survival of motor neuron protein in axons and growth cones.
M. Sendtner, Universitat Wuerzburg, Germany: Axonal defects in motor neurons from mouse models of SMA.

SESSION 6: Axonal Pathfinding, Maturation, and Maintenance I
Chairperson: K.H. Fischbeck, National Institute of Neurological Disorders and Stroke, NIH, Bethesda, Maryland

L.F. Parada, University of Texas Southwestern Medical Center, Dallas: Lessons to be learned from modeling neurofibromatosis.
S.L. Pfaff, Salk Institute, La Jolla, California: LIM transcription factors and spinal motor neuron development.

SESSION 7: Axonal Pathfinding, Maturation, and Maintenance II
Chairperson: G.D. Fischbach, Columbia University, New York

K. Zinn, California Institute of Technology, Pasadena: Development and maintenance of neuromuscular junctions.
O. Steward, University of California, Irvine: Sorting and intracellular transport of mRNA in neurons.
H. Keshishian, Yale University, New Haven, Connecticut: Synaptic plasticity in model genetic organism.

SESSION 8: Pharmacologic and Cellular Approaches to, and Clinical Trial Design for, SMA Therapy I
Chairperson: G.D. Fischbach, Columbia University, New York

M. Gurney, deCode Genetics, Inc., Woodbridge, Illinois: Drug discovery step by step.
G. Dreyfuss, HHMI/University of Pennsylvania School of Medicine, Philadelphia: SMA therapeutics development.
B.R. Stockwell, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts: Diagramming disease networks using chemical and biological tools.

SESSION 9: Pharmacologic and Cellular Approaches to, and Clinical Trial Design for, SMA Therapy II
Chairperson: D.C. DeVivo, The Neurological Institute, New York

B. Wirth, Institute of Human Genetics, Bonn, Germany: Search for drugs that increase the expression SMN2.
C.T. Sumner, National Institute of Neurological Disorders and Stroke, NIH, Bethesda, Maryland: Histone deacetylase inhibitors as treatment for spinal muscular atrophy.
A. MacKenzie, Children's Hospital of Eastern Ontario, Ottawa, Canada: Apoptosis-based modulation of SMA.
D. Kerr, Johns Hopkins Hospital, Baltimore, Maryland: Embryonic stem-cell-derived motoneurons from SMA mice.
T. Crawford, Johns Hopkins Hospital, Baltimore, Maryland: Natural history of human SMA and potential surrogate measures necessary to powering clinical trials.
K.J. Swoboda, University of Utah School of Medicine, Salt Lake City: Phenotype/genotype correlates: SMN2 copy number, SMN protein measurement, data, and the role of modifying factors.

SESSION 10: Where Do We Go From Here? Setting Priorities for Finding Therapies for SMA
Discussion Leader: K.H. Fischbeck, National Institute of Neurological Disorders and Stroke, NIH, Bethesda, Maryland

Finding the Functional Elements of the Genome

March 21–24

FUNDED BY **Cold Spring Harbor Laboratory Corporate Sponsor Program**

ARRANGED BY **E. Birney,** European Bioinformatics Institute
A. Chakravarti, Johns Hopkins University School of Medicine
L. Stein, Cold Spring Harbor Laboratory
R. Young, Whitehead Institute for Biomedical Research

Introductory Remarks: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

SESSION 1: Genome Sequence and Protein-coding Genes
Chairperson: E. Birney, European Bioinformatics Institute, Cambridge, United Kingdom

E. Green, National Human Genome Research Institute, NIH, Bethesda, Maryland: Identification of highly conserved genomic elements by multispecies comparative sequencing.

M. Zody and M. Clamp, The Broad Institute, Cambridge, Massachusetts: Feasibility of annotating the human genome through light sequencing of multiple mammals.

B.A. Cohen, University of Washington School of Medicine, St. Louis, Missouri: Comparative genomics in yeast.

D. Kulp, University of Massachusetts, Amherst: A general model of experimental transcriptional evidence.

C.P. Ponting, University of Oxford, United Kingdom: Variations in evolutionary rates of mammalian genes.

SESSION 2: Experimental Techniques to Discover Function
Chairperson: A. Chakravarti, Johns Hopkins University School of Medicine, Baltimore, Maryland

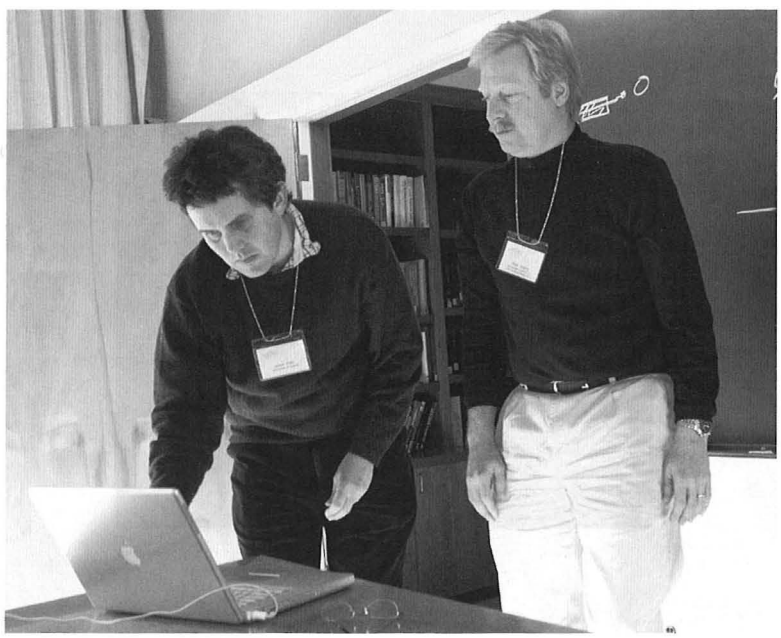
D. Baillie, Simon Fraser University, Burnaby British Columbia, Canada: Using SAGE to identify functional elements in the *C. elegans* genome.

J. Schimenti, The Jackson Laboratory, Bar Harbor, Maine: Relative merits of various in vivo functional genomics strategies in mice.

M. Vidal, Dana-Farber Cancer Institute, Boston, Massachusetts: Networks in biology.

R.A. Young, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts: A draft transcriptional regulatory code for yeast.

J. Hein, University of Oxford, United Kingdom: Two ideas: Rooting by irreversibility and disentangling overlapping selective constraints.



J. Hein, R. Wilson

SESSION 3: Genome-wide Conservation Analysis
Chairperson: E. Green, National Human Genome Research Institute, NIH, Bethesda, Maryland

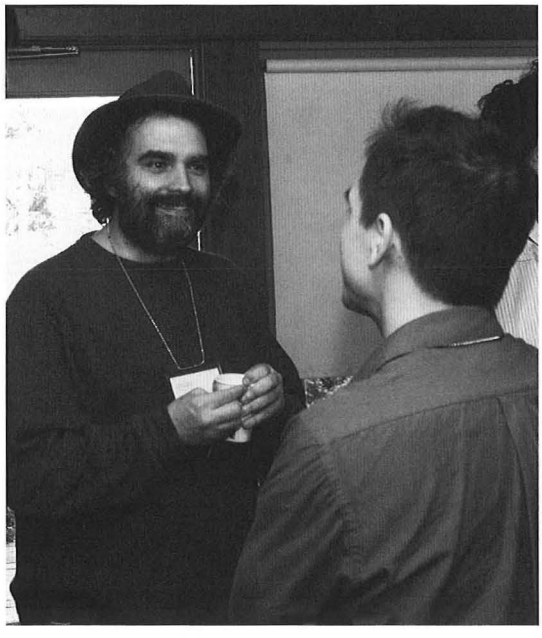
M. Dermitzakis, University of Geneva Medical School, Switzerland: Divergence, polymorphism, and evolutionary characteristics of conserved nongenic sequences.
L. Pachter, University of California, Berkeley: Phylogenetic methods in comparative genomics and applications to functional element identification.
G. Bejerano, University of California, Santa Cruz: Large-scale clustering and analysis of human noncoding DNA.

SESSION 4: Specific Nongenic Features I
Chairperson: L.D. Stein, Cold Spring Harbor Laboratory

S. Griffiths-Jones, The Wellcome Trust Sanger Institute, Cambridge, United Kingdom: Progress toward a one-stop noncoding RNA annotation shop.
E. Fraenkel, Whitehead Institute, Cambridge, Massachusetts: Combining diverse data sources to identify transcription-factor-binding sites.
G.D. Stormo, Washington University Medical School, St. Louis, Missouri: Finding regulatory motifs using coregulated genes from multiple species.
E. Birney, European Bioinformatics Institute, Cambridge, United Kingdom: *Cis*-regulatory discovery in vertebrates.
E. Segal, Stanford University, California: Genome-wide discovery of *cis*-regulatory modules using sequences, expression, and location data.
S. Jones, Genome Sciences Centre, Vancouver, British Columbia, Canada: Integrated approaches to regulatory element detection using the Sockeye platform.
A. Chakravarti, Johns Hopkins University School of Medicine, Baltimore, Maryland: Coding and noncoding mutations in human complex disease.
L.D. Stein, Cold Spring Harbor Laboratory: An ontology of functional elements.

Summary

E. Birney, European Bioinformatics Institute, Cambridge, United Kingdom
A. Chakravarti, Johns Hopkins University School of Medicine, Baltimore, Maryland
L.D. Stein, Cold Spring Harbor Laboratory
R.A. Young, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts



J. Kent, D. Kulp

Neuronal and Behavioral Effects of Ras/MAPK Signaling

April 4–7

FUNDED BY **Cold Spring Harbor Laboratory Corporate Sponsor Program**

ARRANGED BY **A. Silva,** University of California, Los Angeles
J.D. Sweatt, Baylor College of Medicine
L. Van Aelst, Cold Spring Harbor Laboratory
J.J. Zhu, University of Virginia School of Medicine

Introduction: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

SPECIAL SESSION
Chairperson: L. Van Aelst, Cold Spring Harbor Laboratory: Introduction

S. Tonegawa, Massachusetts Institute of Technology, Cambridge: Translational control by MAPK signaling in long-term synaptic plasticity and memory.

E.R. Kandel, HHMI/Columbia University, New York: On molecular mechanisms for synaptic growth and the perpetuation of long-term synaptic plasticity.

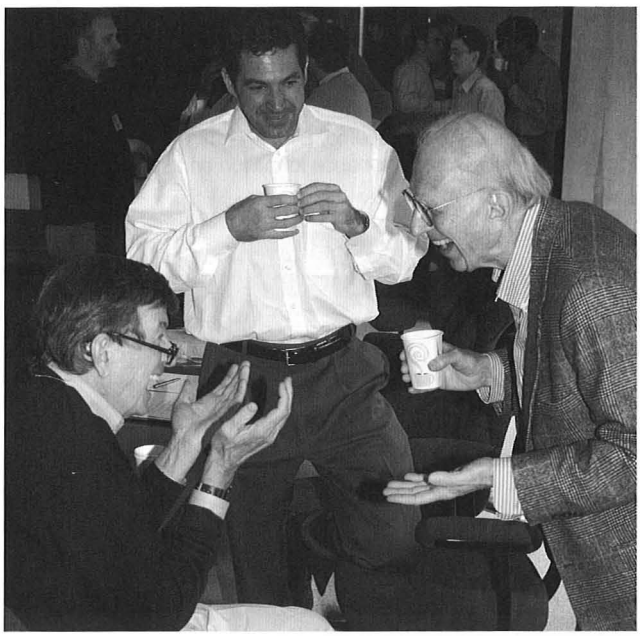
SESSION 1: Learning and Memory
Chairperson: A. Silva, University of California, Los Angeles: Introduction

J.D. Sweatt, Baylor College of Medicine, Houston, Texas: Regulation and targets of ERK in the hippocampus.

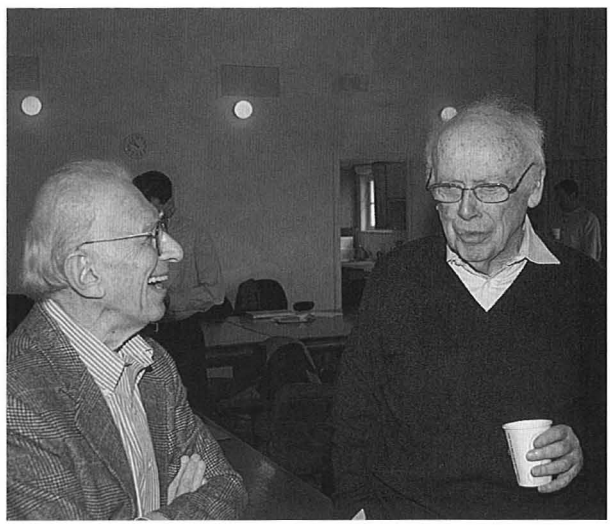
S.A. Siegelbaum, Columbia University College of Physicians & Surgeons, New York: p38 MAPK/12-lipoxygenase signaling in mGluR LTD.

K. Rosenblum, Haifa University, Israel: Role of MAPK in memory and LTP consolidation.

D.R. Storm, University of Washington School of Medicine, Seattle: A new mechanism for sensitization of Erk MAP kinase during memory formation.



R. Nicoll, D. Bredt, E. Kandel



E. Kandel, J.D. Watson

SESSION 2: Learning and Memory
Chairperson: R. Malinow, Cold Spring Harbor Laboratory: Introduction

R. Brambilla, DIBIT-HSR, Milano, Italy: Ras/MAPK signalling in stratum-dependent behavioral plasticity.
Y. Elgersma, Erasmus MC, Rotterdam, The Netherlands: Role of presynaptic Ras signaling in learning and memory.
P. Stork, Vollum Institute, Oregon Health Sciences University, Portland: Rap1 activation of ERKs in neuronal cell types.

SESSION 3: Cognitive Disorders and Pathology
Chairperson: J.J. Zhu, University of Virginia School of Medicine, Charlottesville: Introduction

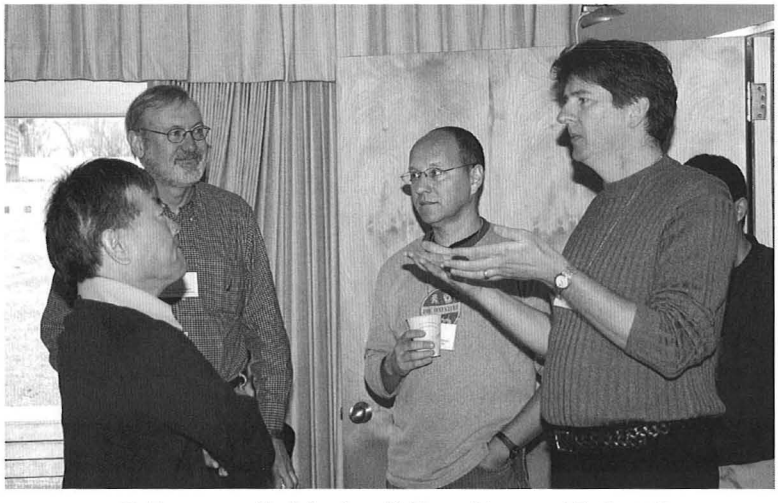
A. Silva, University of California, Los Angeles: Role of neurofibromin in the regulation of synaptic inhibition, plasticity, and learning and memory: Implications to the treatment of NF1.
Y. Zhong, Cold Spring Harbor Laboratory: Ras-Giap (NF1)-medicated signaling in learning vs. memory.
L. Mucke, University of California, San Francisco: Behavioral deficits in transgenic models of Alzheimer's disease: Are they due to alterations in MAPK/ERK-related pathways?
S. Dudek, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Somatic vs. synaptic ERK activation: Roles of action potentials, frequency, and mode of calcium entry.
E. Thiels, University of Pittsburgh, Pennsylvania: MAPK in hippocampal synaptic plasticity: How specific of a signal is it?

SESSION 4: Synaptic and Morphological Plasticity
Chairperson: M.H. Sheng, HHMI/Massachusetts of Technology, Cambridge: Introduction

D.S. Bredt, University of California, San Francisco: Stargazin: An AMPA receptor subunit.
G. Thomas, Johns Hopkins School of Medicine, Baltimore, Maryland: Binding and phosphorylation of PDZ domain proteins by RSK2 regulate synaptic transmission.
H. Cline, Cold Spring Harbor Laboratory: Multiple mechanisms of activity-dependent circuit development in vivo.
R.A. Nicoll, Univesity of California, San Francisco: Stargazin/TARPs: Role in AMPAR trafficking and plasticity in the hippocampus.

SESSION 5: Receptors and Channels
Chairperson: J.D. Sweatt, Baylor College of Medicine, Houston, Texas: Introduction

J.W. Hell, University of Iowa, Iowa City: Regulation of postsynaptic functions by calmodulin, CaMKII, and α-actinin.
B. Lu, National Institute of Neurological Disorders and Stroke, NIH, Bethesda, Maryland: Molecular mechanisms underlying acute and long-term synaptic modulation by neurotrophins.
D. Johnston, Baylor College of Medicine, Houston, Texas: MAPK regulation of dendritic K^+ channels in hippocampal neurons.
L. Mei, University of Alabama, Birmingham: Prenylation as a novel mechanism in synapse formation and synaptic plasticity.



S. Tonegawa, D. Johnston, K. Rosenblum, and D. Sweatt

Microbial Forensics

April 18–21

FUNDED BY **U.S. Department of Homeland Security (through a grant to the UMDNJ–New Jersey Medical School**

ARRANGED BY **J. Burans,** U.S. Department of Homeland Security
B. Budowle, FBI Laboratory
S.E. Schutzer, UMDNJ–New Jersey Medical School

Introduction: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
B. Budowle, FBI Laboratory, Quantico, Virginia
S.E. Schutzer, UMDNJ–New Jersey Medical School, Newark

SESSION 1: Scenarios Where Microbial Forensics May Be Applied
Chairperson: S.E. Schutzer, UMDNJ–New Jersey Medical School, Newark

J.P. Burans, U.S. Department of Homeland Security, Frederick, Maryland: Mission, operation, and structure of the National Bioforensic Analysis Center. Needs of the BFAC.

B. Budowle, FBI Laboratory, Quantico, Virginia: Points to consider for microbial forensics.

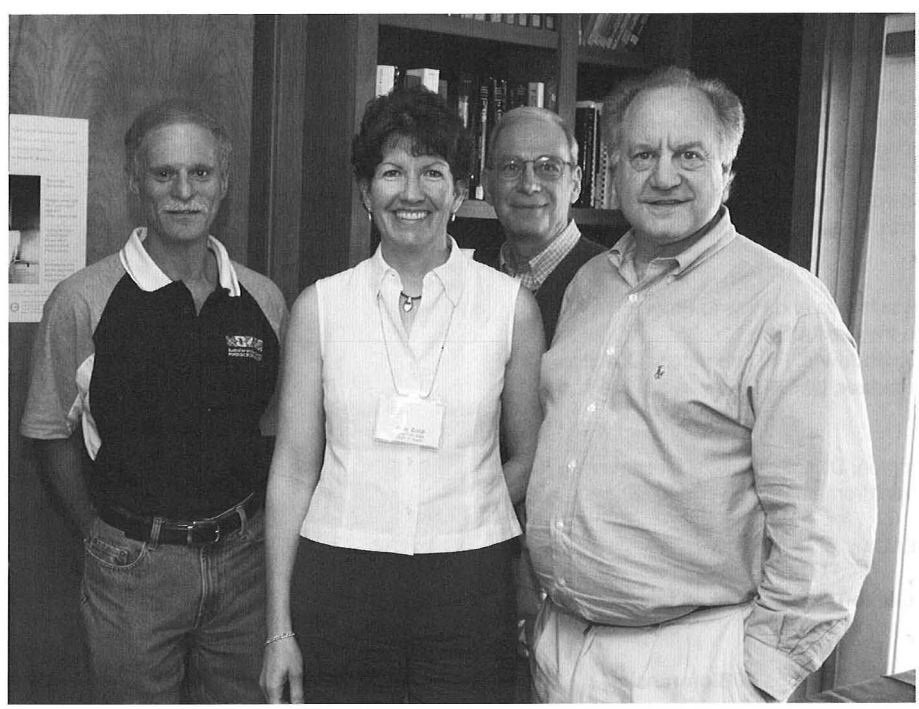
R.S. Murch, Institute for Defense Analysis, Alexandria, Virginia: Scenario I: Description and interactive participation with audience expertise.

R.S. Murch, Institute for Defense Analysis, Alexandria, Virginia: Scenario II: Description and interactive participant with audience expertise.

SESSION 2: Collection, Handling, and Analysis of Evidentiary Samples
Chairperson: B.J. Luft, Stony Brook University, New York

D. Beecher, FBI Laboratory, Quantico, Virginia: Current methods and FBI protocols for sample collection and handling: Bulk material and traces of bacteria, viruses, and toxins.

R. Okinaka, Los Alamos National Laboratory, New Mexico: Merging SNP discovery and rapidly evolving markers toward forensic signatures.



B. Budowle, A. Walsh, J. Dunn, S. Schutzer

R. Winegar, Midwest Research Institute, Palm Bay, Florida: Extraction and recovery of minute quantities of nucleic acids from dilute samples and complex matrices.
J. Ravel, Microbial Genomics, Rockville, Maryland: High-throughput sequencing and comparative genomic potentials for microbial forensics.
P.J. Jackson, Los Alamos National Laboratory, New Mexico: Pathogen genotyping.

SESSION 3: Scientific Approaches (II) and Interpretation
Chairpersons: P.J. Jackson, Los Alamos National Laboratory, New Mexico; **D.L. Rock,** USDA Agricultural Research Service, Greenport, New York

B. Budowle, FBI Laboratory, Quantico, Virginia: Preservation of traditional forensic material: Finding trace evidence to link a suspect to biocrime/bioterrorism.
S. Velsko, Lawrence Livermore National Laboratory, California: Instrumental analysis and interpretation.
R.B. Harris, Commonwealth Biotechnologies, Inc., Richmond, Virginia: Analysis, confirmation, and identification of bio-agent toxins: A tiered mass spectrometry approach.
R. Chakraborty, University of Cincinnati, Ohio: Issues of diversity and variation and impact on interpretation.
D.J. Ecker, IBIS Therapeutics, ISIS Pharmaceuticals, Carlsbad, California: Combinatorial methodologies as applied to microbial forensics.

SESSION 4: Animal Pathogens; Host Response
Chairperson: D.R. Franz, Midwest Research Institute, Frederick, Maryland

D.L. Rock, USDA Agricultural Research Service, Greenport, New York: Comparative and functional genomics: Application for human and animal microbial forensics.
B.J. Luft, SUNY, Stony Brook, New York and M.S. Ascher, Lawrence Livermore National Laboratory, California: Antibiotic bioavailability in the host as a potential bioforensic marker: Half-lives and tissue deposition.
S.E. Schutzer, UMDNJ–New Jersey Medical School, Newark: Temporal host responses marking specific pathogen exposure.

SESSION 5: Lessons Not Yet Learned: Critical Gaps in Microbial Forensics
Chairpersons: B. Budowle, FBI Laboratory, Quantico, Virginia; **R. Breeze,** Washington, D.C.

S.A. Morse, Centers for Disease Control and Prevention, Atlanta, Georgia: Role of public health system.
B. Budowle and J. Bannan, FBI Laboratory, Quantico, Virginia: Role of the FBI in coordinating investigation of biocrime and bioterrorism with local law enforcement.
J.W. Ezzell, U.S. Army Medical Research Institute of Infectious Diseases, Fort Detrick, Maryland; L.W. J. Baillie, Noval Medical Research Center, Silver Spring, Maryland; D. Beecher, FBI Laboratory, Quantico, Virginia; and T. Slezak, Lawrence Livermore National Laboratory, California: Experiences from anthrax and ricin attacks.

SESSION 6: The Judicial System
Chairperson: L.W.J. Baillie, Naval Medical Research Center, Silver Spring, Maryland

R.P. Harmon, Alameda County District Attorney's Office, Oakland, California: Legal issues: Examples from previous court cases.

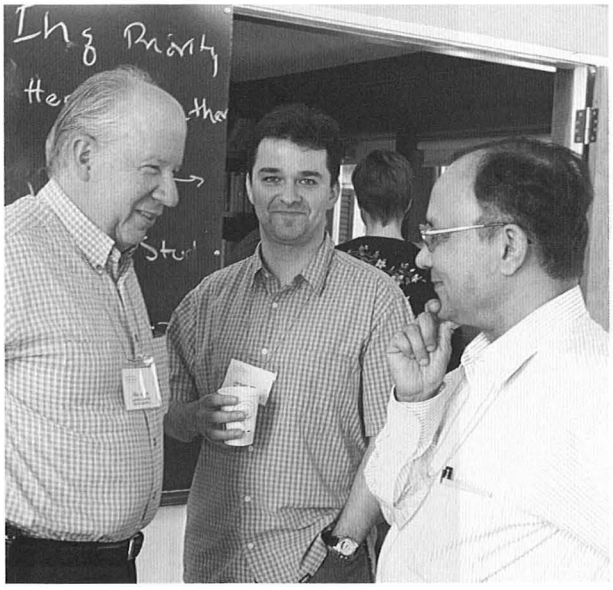
SESSION 7: Critical Issues and How to Proceed to Address the Gaps before the Next Attack
Chairpersons: B. Budowle, FBI Laboratory, Quantico, Virginia; **S.E. Schutzer,** UMDNJ–New Jersey Medical School, Newark

R. Breeze, Washington, D.C.: Agricultural biocrimes are fundamentally different from attacks on people.

Items for the BFAC

Items That Should be Discussed at all Levels of Government

Research Needed to Fill Gaps in Bioforensics



M. Ascher, J. Ravel, R. Chakraborty

New Pharmacological and Neurobiological Approaches to the Treatment of Fragile X

April 25–28

FUNDED BY **NIH–National Institute of Mental Health (through a grant to University of Illinois)**

ARRANGED BY **W.T. Greenough,** University of Illinois, Urbana-Champaign
W. Spooren, F. Hoffmann-La Roche

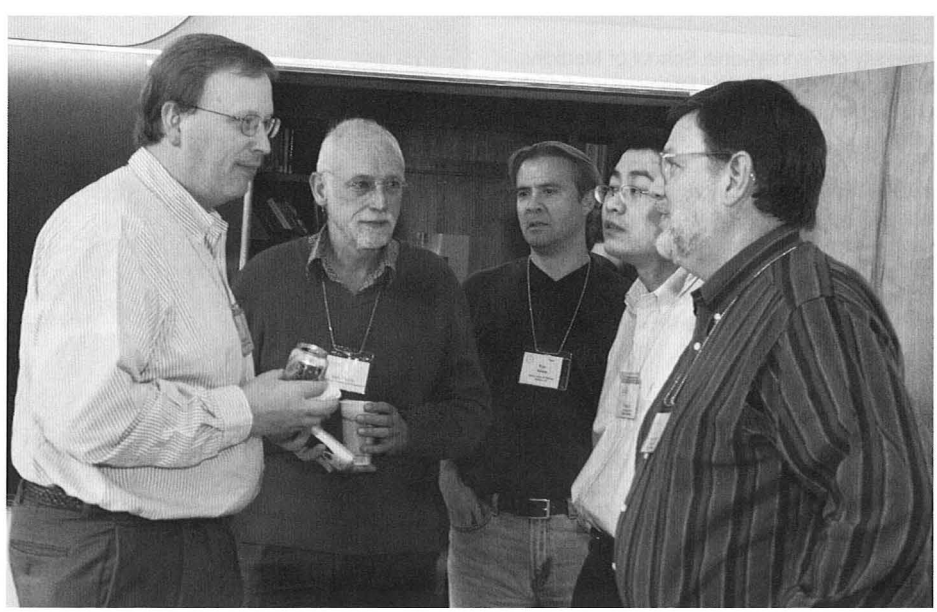
Introduction: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

SESSION 1: Fragile X: The Clinical Perspective
Chairperson: E. Berry-Kravis, Rush Children's Hospital, Chicago, Illinois

K. Clapp, FRAXA Research Foundation, Newburyport, Massachusetts: Fragile X: A patient perspective.
D. Bailey, University of North Carolina, Chapel Hill: The Fragile-X syndrome: Phenotype overview and patterns of medication use.
R.J. Hagerman, University of California Davis Health System, Sacramento: Psychopharmacological interventions in Fragile X.
S.T. Warren, Emory University School of Medicine, Atlanta, Georgia: Molecular mechanisms of Fragile-X phenotype from a molecular perspective.

SESSION 2: FMR-1 Mouse Models
Chairperson: W.T. Greenough, University of Illinois, Urbana

T. Steckler, Johnson & Johnson Pharmaceutical, Beerse, Belgium: Mutant mouse: Where hopes meet reality.
R.E. Paylor, Baylor College of Medicine, Houston, Texas: Behavior of Fmr/KO mice: Role of genetic background and therapeutic interventions.
B.A. Oostra, Erasmus Universiteit Rotterdam, The Netherlands: Enhanced LTD at enlarged Purkinje cell spines in the cerebellum causes motor learning deficits in Fragile-X syndrome.
M. Toth, Cornell University Medical College, New York: Hyperactivity of Fragile-X mice to sensory stimuli: Network hyperexcitability and alterations in FMRP-target expression.



D. Nelson, B. Oostra, E. Klann, P. Jin, S. Warren

SESSION 3: FMR1 and the Neurobiology of Fragile X
Chairperson: D.L. Nelson, Baylor College of Medicine, Houston, Texas

R.K.S. Wong, SUNY-Health Science Center, Brooklyn, New York: Metabotropic glutamate receptors and epileptogenesis in Fragile-X syndrome.
R.P. Bauchwitz, St. Luke's–Roosevelt Institute of Health Sciences, Columbia University, New York: What elevated audiogenic seizure susceptibility in Fragile-X mice reveals about the etiology of Fragile-X syndrome.
P.W. Vanderklish, Scripps Research Institute, La Jolla, California: Regulatory interactions between synaptic structure and local translation.
E. Klann, Baylor College of Medicine, Houston, Texas: Regulation of translation signaling pathways during mGluR-LTD in Fmr1 knockout mice.
J. Julius Zhu, University of Virginia School of Medicine, Charlottesville: Ras signaling of excitatory synapses of FMR1 knockout mice.
M.F. Bear, HHMI/Massachusetts Institute of Technology, Cambridge: The mGluR theory of Fragile X in mental retardation.

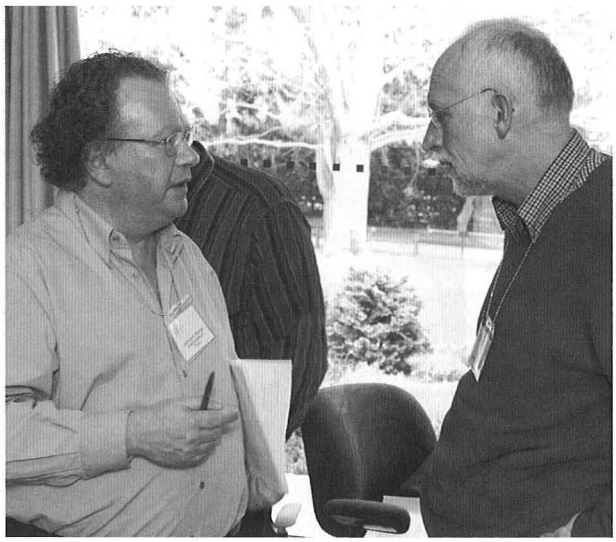
SESSION 4: Emerging Drugable Targets: mGlu Receptors
Chairpersons: W. Spooren, F. Hoffmann-La Roche, Basel, Switzerland; **G. Bilbe,** Novartis Institutes for BioMedical Research, Basel, Switzerland

M.R. Tranfaglia, FRAXA Research Foundation, Newburyport, Massachusetts: Clinical/psychiatric presentation of Fragile X.
G. Bilbe, Novartis Pharma AG, Basel, Switzerland: A drug discovery perspective: Translation from bench to bedside.
V. Mutel, Addex Pharmaceuticals SA, Geneva, Switzerland: Drugability of targets.
M.P. Johnson, Eli Lilly and Company, Indianapolis, Indiana: Advances in glutamate receptor pharmacology: Targets galore.
F. Gasparini, Novartis Pharma AG, Basel, Switzerland: Allosteric modulation for the mGlu receptors: Antagonists, positive modulators, neutral ligands.
T. Steckler, Johnson & Johnson Pharmaceutical, Beerse, Belgium: CRF, antagonists as anxiolytic and antidepressant drugs.
W. Spooren, F. Hoffmann-La Roche, Basel, Switzerland: Neurokinin 3 (NK3) receptors: A new target for the treatment of psychosis?
G.R. Dawson, Merck Sharp & Dohme Research Laboratories, Essex, United Kingdom: Role of GABA-A receptor subtypes in anxiety and cognition.
B. Bettler, Universitat Basel, Switzerland: GABA-B receptors: Drug targets for Fragile-X disorders?
C. Dobkin, New York State Institute for Basic Research, Staten Island: Seizure susceptibility of the Fragile-X mouse and alterations of the GABAergic system.

SESSION 5: Developing Drugs for Fragile X
Chairperson: D. Bailey, University of North Carolina, Chapel Hill

T.A. Jongens, University of Pennsylvania School of Medicine, Philadelphia: Effect of pharmacological interventions (MPEP) on phenotype in the *Drosophila* Fragile-X mutant MPEP: Results in *Drosophila*.
P. Jin, Emory University, Atlanta, Georgia: Potential roles of microRNA and MPEP in Fragile-X syndrome.
H.G.M. Westenberg, University Medical Center Utrecht, The Netherlands: On the role of dopamine in anxiety disorders: Recent findings OCD and social anxiety disorder.
E. Berry-Kravis, Rush Children's Hospital, Chicago, Illinois: Clinical trial of Ampakine CX516 in Fragile-X syndrome.

SESSION 6: Strategies and Goals for Developing Therapies
Moderators: M.R. Tranfaglia, FRAXA Research Foundation, Newburyport, Massachusetts; **W. Spooren,** F. Hoffmann-La Roche, Basel, Switzerland



J.-L. Claverie, B. Oostra

Breast Cancer Research: A Critical Review for Future Strategies

May 9–12

FUNDED BY **Den Haag Foundation**

ARRANGED BY **J. Sambrook,** Peter MacCallum Cancer Institute
B. Stillman, Cold Spring Harbor Laboratory

Introduction: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
B. Stillman, Cold Spring Harbor Laboratory
J. Sambrook, Peter MacCallum Cancer Institute, Melbourne, Australia

SESSION 1: Epidemiology and Risk Assessment
Chairperson: B.J. Ponder, Cancer Research United Kingdom, Cambridge

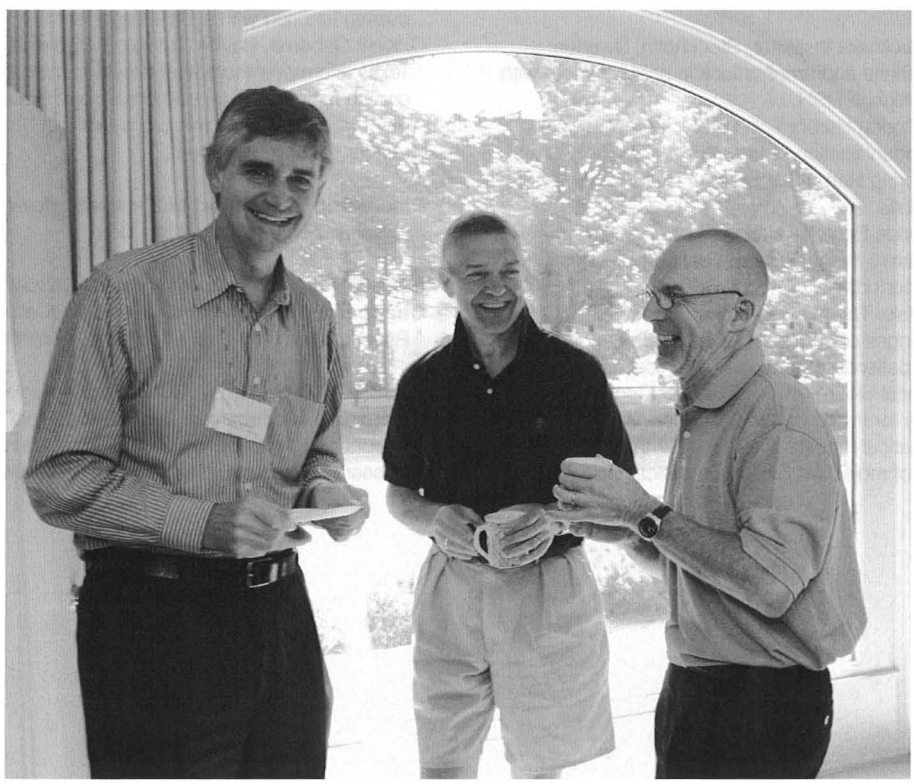
D. Easton, Cancer Research United Kingdom, Cambridge: Risk models for breast cancer: What they tell us and what we still need to know.
M. Dowsett, Royal Marsden Hospital, London, United Kingdom: Fitting steroid analyses into risk algorithms for breast cancer: Opportunities and challenges.

Discussion Moderator: B.J. Ponder, Cancer Research United Kingdom, Cambridge

SESSION 2: Stem Cells and Development
Chairperson: L.A. Chodosh, University of Pennsylvania School of Medicine, Philadelphia

T.D. Tlsty, University of California, San Francisco: Early genetic and epigenetic events in breast cancer.
E.M. Rosen, Georgetown University, Washington, D.C.: BRCA1-endocrine interactions: Implications for breast cancer control and therapy EMR.

Discussion Moderator: L.A. Chodosh, University of Pennsylvania School of Medicine, Philadelphia



B. Stillman, J.A. Witkowski, J. Sambrook

SESSION 3: Genetics
Chairperson: G. Chenevix-Trench, The Queensland Institute of Medical Research, Herston, Australia

K. Offit, Memorial Sloan-Kettering Cancer Center, New York: Linkage disequilibrium mapping: A tool for breast cancer susceptibility gene rediscovery?
B.J. Ponder, Cancer Research United Kingdom, Cambridge: Low-penetrance genes and implications for prevention.
M.-C. King, University of Washington School of Medicine, Seattle: An approach for finding more genes for inherited breast cancer.

Discussion Moderator: G. Chenevix-Trench, The Queensland Institute of Medical Research, Herston, Australia

SESSION 4: Decision Making
Chairperson: C. Scott, Cold Spring Harbor Laboratory

K. Armstrong, University of Pennsylvania, Philadelphia: Moving into clinical practice: Technology assessment/adoption and diffusion.

Discussion Moderator: C. Scott, Cold Spring Harbor Laboratory

SESSION 5: Genomic Changes and Targets I
Chairperson: T. Tlsty, University of California, San Francisco

A. Zetterberg, Karolinska Institutet, Stockholm, Sweden: Analysis of deletions and amplications in breast cancer with quantitative multigene FISH.
M. Wigler, Cold Spring Harbor Laboratory: Combinatorial approaches to identification of targets.
J. Hicks, Cold Spring Harbor Laboratory: ROMA analysis of group cancer cells.
J.W. Gray, Lawrence Berkeley National Laboratory, Berkeley, California: Genomic events in breast cancer: Diagnostic and therapeutic opportunities.
A.-L. Borresen-Dale, The Norwegian Radium Hospital, Oslo, Norway: Challenges of combining large-scale genomic data of tumors with patients' genotype and clinical outcome.
L. Norton, Memorial Sloan-Kettering Cancer Center, New York: Strategies for improving breast cancer therapy by the use of mathematical models of tumor growth kinetics and the integration of molecular profiling in clinical trials.

SESSION 6: Genomic Changes and Targets II
Chairperson: B. Stillman, Cold Spring Harbor Laboratory

D. Sgroi, Massachusetts General Hospital, Charlestown: Expression profiling of human breast cancer with capture microdissection.

Discussion Moderator: E.M. Rosen, Georgetown University, Washington, D.C.

SESSION 7: Animal Models
Chairperson: S. Lowe, Cold Spring Harbor Laboratory

J. Green, National Cancer Institute, Bethesda, Maryland: Genomic approaches to understanding mammary cancer evolution using mouse models.
L.A. Chodosh, University of Pennsylvania School of Medicine, Philadelphia: Genetically engineered mouse models for breast cancer susceptibility. Oncogene reversibility and progression.

Discussion Moderator: S. Lowe, Cold Spring Harbor Laboratory

SESSION 8: Targets and Trials
Chairperson: M. Dowsett, Royal Marsden Hospital, London, United Kingdom

M. Pike, University of California School of Medicine, Los Angeles: Experience with a breast cancer chemoprevention regimen for premenopausal women based on blocking ovarian function with a GnRH agonist.
C. Kent Osborne, Baylor College of Medicine, Houston, Texas: Hormone therapy of breast cancer: How ER and growth factor receptor pathways collaborate to cause treatment failure and how this cross-talk can be overcome to restore effective treatment.

Discussion Moderator: M. Dowsett, Royal Marsden Hospital, London, United Kingdom

SESSION 9: Infrastructure for Breast Cancer Research
Chairperson: J. Sambrook, Peter MacCallum Cancer Research Institute, East Melbourne, Australia

SESSION 10: Summary: Goals and Strategies
Discussion Moderators: B. Stillman, Cold Spring Harbor Laboratory; **J. Sambrook,** Peter MacCallum Cancer Research Institute, East Melbourne, Australia

Communication in Brain Systems

May 16–19

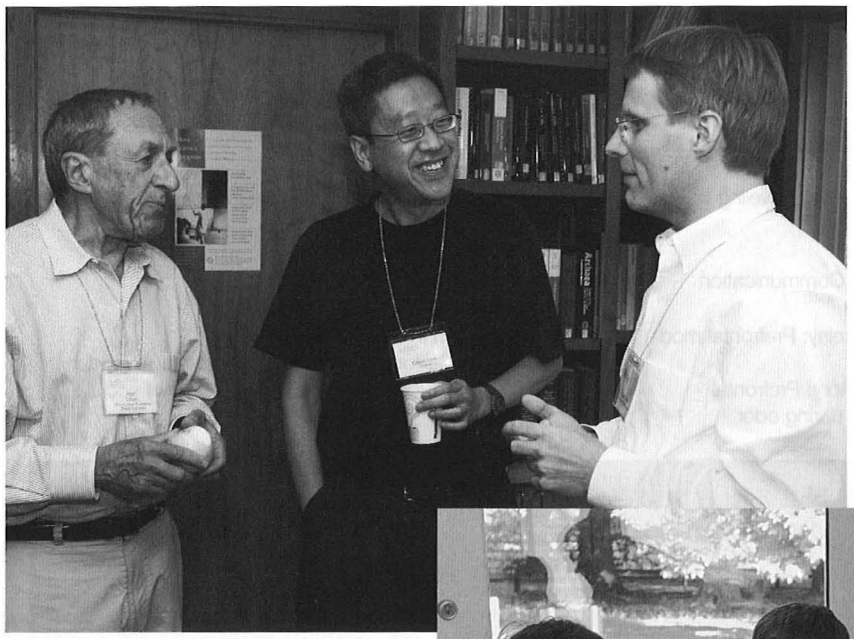
FUNDED BY **The Swartz Foundation and The Alfred P. Sloan Foundation**

ARRANGED BY **T. Sejnowski,** The Salk Institute for Biological Studies

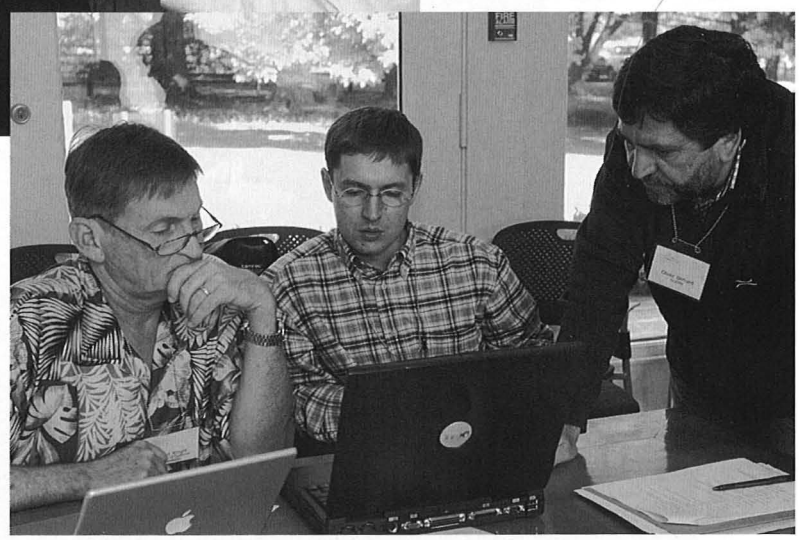
Introductions: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
T. Sejnowski, The Salk Institute for Biological Studies, San Diego, California

SESSION 1: Constraints on Communication
Chairperson: T. Sejnowski, The Salk Institute for Biological Studies, San Diego, California

D. Chklovskii, Cold Spring Harbor Laboratory: Brain architecture maximizes neuronal connectivity while minimizing time delays.
E. Halgren, Massachusetts General Hospital, Charlestown: Intracolumnar vs. intercolumnar communication in the human neocortex.
O. Bertrand, INSERM, Lyon, France: Functional modulations of local and long-distance β/γ oscillatory synchronization: Evidence from direct intracranial recordings in humans.
S. Makeig, University of California, San Diego: Multiscale evidence of multiscale brain communication.



H. Cohen, G. Chin, G. Tanoni



R. Knight, P. Fries, O. Bertrand

SESSION 2: Regulation of Communication
Chairperson: S. Makeig, University of California, San Diego

P. Fries, University of Nijmegen, The Netherlands: Neuronal coherence in man and monkey.
E. Buffalo, National Institutes of Health/NIMH, Bethesda, Maryland: Layer-specific attentional modulation of neuronal synchrony.
T. Sejnowski, The Salk Institute for Biological Studies, San Diego, California: Inhibitory mechanisms for attentional gain control.
G. Rainer, Max-Planck Institute for Biological Cybernetics, Tübingen, Germany: Phase locking of single neuron activity to theta oscillations during working memory in monkey extrastriate visual cortex.
M. Kahana, Brandeis University, Waltham, Massachusetts: From oscillations in the immature and mature human cortex.
K.K. Kaila, University of Helsinki, Finland: Infraslow oscillations in the immature and mature human cortex.

SESSION 3: Computation and Communication
Chairperson: J.M. Allman, California Institute of Technology, Pasadena

E. Salinas, Wake Forest University of Medicine, Winston-Salem, North Carolina: Gain modulation as a mechanism for the selection of functional circuits.
R. Rao, University of Washington, Seattle: Probabilistic models of cortical computation and communication.
J.H. Reynolds, The Salk Institute for Biological Studies, La Jolla, California: Surface-based attention determines dominance in binocular rivalry.
X.-J. Wang, Brandeis University, Waltham, Massachusetts: Cortical circuits of working memory and decision-making.

SESSION 4: Communication Infrastructure
Chairperson: D. Chklovskii, Cold Spring Harbor Laboratory

R. Sarpeshkar, Massachusetts Institute of Technology, Cambridge: Hybrid computation with spikes.
P. Mitra, Cold Spring Harbor Laboratory: Metabolic cost of readiness.
G. Tononi, University of Wisconsin, Madison: Traveling waves and cortical connectivity.
R. da Silveira, Harvard University, Cambridge, Massachusetts: Short paths and signal propagation in a model cortex.
D. Ballard, University of Rochester, New York: Prospects for synchronous communication in the cortex.

SESSION 5: Command and Control of Communication

R.T. Knight, University of California, Berkeley: Prefrontal modulation of sensory processing.
Z.F. Mainen, Cold Spring Harbor Laboratory: Prefrontal and olfactory cortical circuits engaged during odor discrimination in the rat.
J.M. Allman, California Institute of Technology, Pasadena: The fronto-insular cortex and the evolution of social cognition.

T-type Calcium Channels: Their Role in Normal and Pathological CNS Function

May 23–25

FUNDED BY **Cold Spring Harbor Laboratory**

ARRANGED BY **R. Llinas,** New York University Medical Center
E. Perez-Reyes, University of Virginia

Introduction: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory

SESSION 1: Channel Properties
Chairperson: J.R. Huguenard, Stanford University School of Medicine, California

R. Llinas, New York University Medical Center, New York: Calcium T-channel properties and intrinsic neuronal activity.
E. Perez-Reyes, University of Virginia, Charlottesville: Molecular biology of the T-type calcium channel family.
P. Lory, IGH-CNRS UPR, Montpelier, France: New insights into the use of recombinant T-channels to probe neuronal excitability.
Y. Yarom, Hebrew University, Jerusalem, Israel: The density of T-type calcium channels shapes the electrical behavior of the neuron.
T.P. Snutch, University of British Columbia, Vancouver, Canada: Development of novel small molecule T-type calcium channel blockers.

SESSION 2: Rhythms
Chairperson: H.-S. Shin, Korea Institute of Science and Technology, Seoul

D.A. McCormick, Yale University School of Medicine, New Haven, Connecticut: Control of rhythmogenesis in thalamic neurons and networks.
J.R. Huguenard, Stanford University School of Medicine, California: T-channel diversity in thalamic circuits: Functional consequences for rhythm generation.
V. Crunelli, Cardiff University, United Kingdom: Thalamic T-type calcium channels in EEG slow waves.
D. Contreras, University of Pennsylvania, Philadelphia: Thalamic bursting and thalamic quiescence during electrographic seizures.

P. Rhodes, B. Hu, R. Llinas

SESSION 3: T-channel Role in Normal Function
Chairperson: D.A. McCormick, Yale University School of Medicine, New Haven, Connecticut

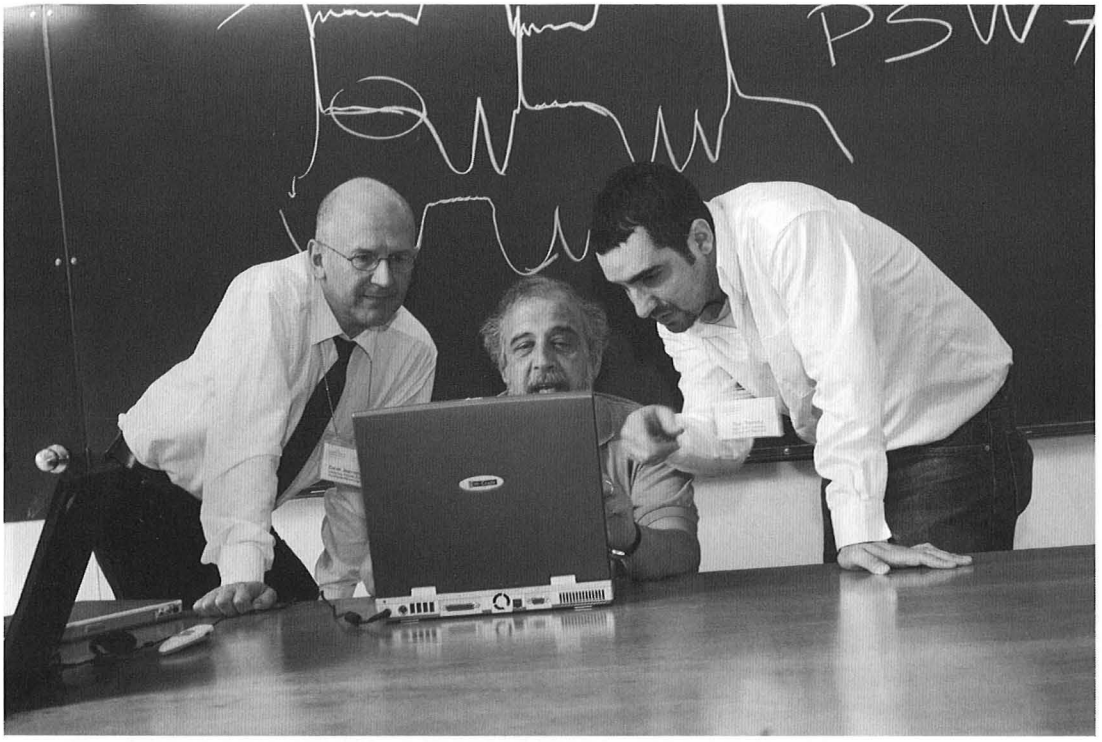
B. Hu, University of Calgary, Alberta, Canada: T-current and posterior sensory cueing network.
H.-S. Shin, Korea Institute of Science and Technology, Seoul: T-type calcium channels in thalamic sensory gating and regulation of novelty-seeking behavior.
G.A. Marini, Centro di Ricerca Sperimentale, Milano, Italy: Low-frequency (7–12 Hz) neuronal oscillations during brain-activated states of behaving rats.
N. Leresche, Neurobiologie Cellulaire, Paris, France: Paradoxical potentiation of neuronal T-type Ca^{2+} current by ATP at resting membrane potential.
T. Bal, Institut de Neurobiologie Alfred Fessard, Gif-sur-Yvette, France: Background synaptic noise, T current, and signal transfer in thalamocortical cells.

SESSION 4: T Channels in Pathological Conditions
Chairperson: V. Crunelli, Cardiff University, United Kingdom

J.L. Noebels, Baylor College of Medicine, Houston, Texas: Thalamic T-type currents in mutant mouse models of epilepsy.
J. Georgia McGivern, Amgen Inc., Thousand Oaks, California: The potential role of T-type calcium channels in neuropathic pain.
X. Xie, SRI International, Menelo Park, California: Mechanism of lamotrigine actions: Implications in bipolar disorder.
S. Todorovic, University of Virginia, Charlottesville: Volatile anesthetics disrupt signaling in the thalamus mediated by a slowly inactivating T-type calcium channel.
D. Jeanmonod, University Hospital Zurich, Switzerland: Low-threshold calcium spike bursts and the human thalamocortical dysrhythmia.

Goals and Strategies
Moderators: R. Llinas, New York University Medical Center; **E. Perez-Reyes,** University of Virginia

Closing Remarks: J.D. Watson, Cold Spring Harbor Laboratory



D. Jeanmonod, V. Crunelli, R. Ramirez

RNAi-related Processes in Plants: Chromatin, Development, and Defense

August 15–18

FUNDED BY **Cold Spring Harbor Laboratory Corporate Sponsor Program**

ARRANGED BY **J.C. Carrington,** Oregon State University
S. Jacobsen, University of California, Los Angeles
D. Weigel, Max-Planck Institute for Developmental Biology

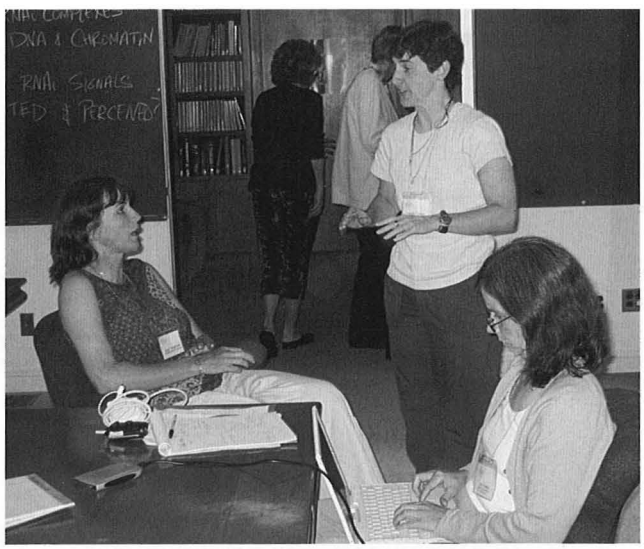
Introduction: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
J.C. Carrington, Oregon State University, Corvallis

SESSION 1: Mechanisms, Components, and Intersections
Chairperson: D. Weigel, Max-Planck Institute for Developmental Biology, Tübingen, Germany

D.C. Baulcombe, The Sainsbury Laboratory, Norwich, United Kingdom: Systemic signaling and epigenetic mechanisms in RNA silencing.
H. Vaucheret, Laboratoire de Biologie Cellulaire, Versailles, France: Interconnections between miRNA and siRNA pathways in plants.
J.C. Carrington, Oregon State University, Corvallis: Diversification, intersection, and evolution of small RNA pathways.
O.C. Voinnet, Institute de Biologie Moleculaire des Plantes du CNRS, Strasbourg, France: In planta imaging of miRNA transcription and endonucleolytic cleavage activity.
G. Hannon, Cold Spring Harbor Laboratory: RNAi: Mechanism and application.
L. Joshua-Tor, Cold Spring Harbor Laboratory: Slicer–Revealed.
D.J. Patel, Memorial Sloan-Kettering Cancer Center, New York: Protein-RNA recognition events in RNA interference.

SESSION 2: RNAi, Chromatin, and Transcriptional Silencing
Chairperson: B. Bartel, Rice University, Houston, Texas

S. Jacobsen, University of California, Los Angeles: RNA-directed chromatin modifications in *Arabidopsis*.
S. Henikoff, Fred Hutchinson Cancer Research Center, Seattle, Washington: DNA methylation profiling identifies targets of epigenetic regulators in *Arabidopsis*.
M. Matzke, Austrian Academy of Sciences, Vienna: Genetic analysis of RNA-mediated transcriptional gene silencing.
J. Bender, Johns Hopkins University, Baltimore, Maryland: RNA-directed DNA methylation of the endogenous PAI genes in *Arabidopsis*.
C.S. Pikaard, Washington University, St. Louis, Missouri: Ribosomal RNA gene silencing.
P.M. Waterhouse, CSIRO Plant Industry, Canberra, Australia: siRNA-mediated methylation in plants.



M. Timmermans, J. Fletcher, K. Barton

SESSION 3: RNAi, Chromatin, and Development
Chairperson: S. Jacobsen, University of California, Los Angeles

V.L. Chandler, University of Arizona, Tucson: Role of tandem repeats in paramutation at the *b1* locus in maize.
R. Martienssen, Cold Spring Harbor Laboratory: Heterochromatin, RNAi, and epigenetic gene control.
C. Dean, J. Innes Centre, Norwich, United Kingdom: Do small RNAs play a role in *FLC* regulation?
R. Amasino, University of Wisconsin, Madison: Epigenetic regulation of flowering via vernalization.
X. Chen, Waksman Institute, Rutgers University, Piscataway, New Jersey: siRNAs in the regulation of natural flowering behavior in *Arabidopsis*.
J.-K. Zhu, University of California, Riverside: Small RNAs, transcriptional gene silencing, and their role in abiotic stress responses.

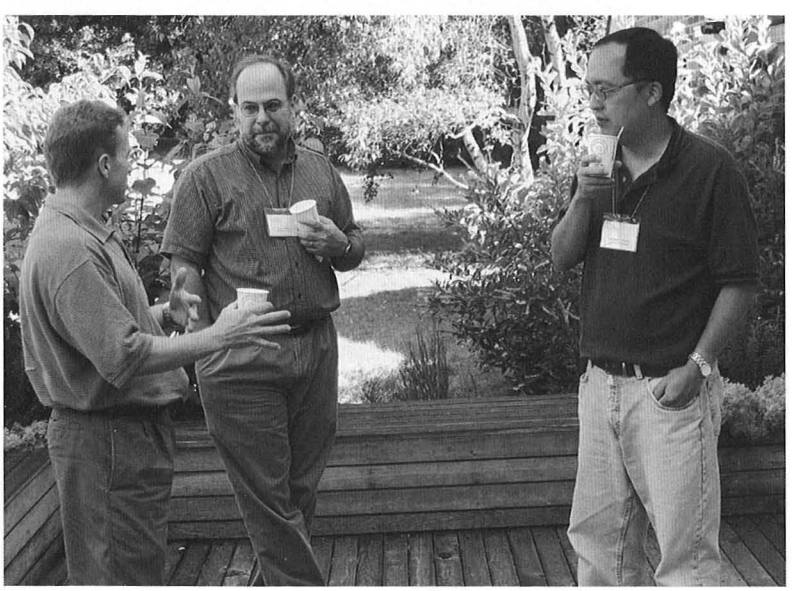
SESSION 4: microRNAs and Developmental Mechanisms
Chairperson: D.C. Baulcombe, The Sainsbury Laboratory, Norwich, United Kingdom

B. Bartel, Rice University, Houston, Texas: MicroRNA regulation of NAC-domain targets is required for proper formation and separation of adjacent embryonic, vegetative, and floral organs.
D. Weigel, Max-Planck Institute for Developmental Biology, Tübingen, Germany: Specificity of plant microRNAs.
K. Barton, Carnegie Institution of Washington, Stanford, California: MicroRNA-mediated methylation of the class III HD-ZIP genes.
M. Timmermans, Cold Spring Harbor Laboratory: miRNA signals specify adaxial/abaxial leaf polarity.
J. Fletcher, USDA/University of California, Berkeley, Albany: MicroRNA regulation of *Arabidopsis* shoot apical meristern activity.
R. Scott Poethig, University of Pennsylvania, Philadelphia: Role for RNAi in the regulation of vegetative phase change in *Arabidopsis*.

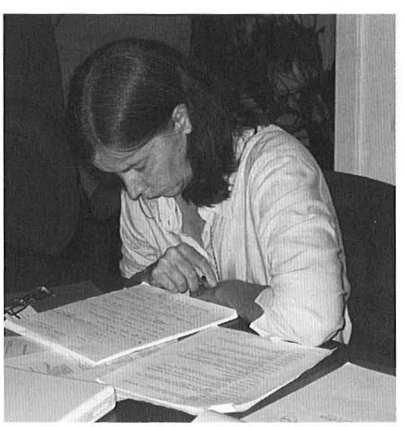
SESSION 5: Defense, Counterdefense, and Posttranscriptional Silencing
Chairperson: M. Matzke, Austrian Academy of Sciences, Vienna

S. Huang, Monsanto Company, Mystic, Connecticut: Use of gene suppression to alter the amino acid composition of corn grain.
P. Green, University of Delaware, Newark: Novel approaches with potential for identification of small RNAs and target mRNAs.
T. Hall, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Size selective recognition of siRNA by an RNA silencing suppressor.
J. Burgyan, Agricultural Biotechnology Center, Godollo, Hungary: Molecular aspects of plant-virus-induced RNAi and suppression.
S.-W. Ding, Center for Plant Cell Biology, University of California, Riverside: miRNAs in viral pathogenesis.
V.B. Vance, University of South Carolina, Columbia: Dissecting the roles of HC-Pro and *Arabidopsis* dicer-like proteins in small RNA metabolism.
B. Ding, Ohio State University, Columbus: Viroid: A small noncoding RNA that traffics within a plant and alters developmental processes.

Summary: Moderator: J.C. Carrington, Oregon State University, Corvallis



J. Roberts, T. Adams, S. Huang



K. Barton

Origins and Evolution of the Nervous System

August 29–September 1

FUNDED BY **Cold Spring Harbor Laboratory Corporate Sponsor Program**

ARRANGED BY **V. Hartenstein,** University of California, Los Angeles
I.A. Meinertzhagen, Dalhousie University, Halifax, Nova Scotia

Introduction: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
V. Hartenstein, University of California, Los Angeles
I.A. Meinertzhagen, Dalhousie University, Halifax, Nova Scotia

SESSION 1: To Begin at the Beginning: CNS Component Molecules ("Nuts and Bolts")
Chairperson: P.A.V. Anderson, University of Florida, St. Augustine

H.C. Berg, Harvard University, Cambridge, Massachusetts: *E. coli* in motion: Physics of a single-celled nervous system.
R.W. Meech, University of Bristol, United Kingdom: Role of ion channels in sponge and jellyfish behavior: Minimalism and beyond.
B.M. Degnan, University of Queensland, Brisbane, Australia: Origins of the nervous systems: Insights from sponges and other basal metazoans.
P.A.V. Anderson, University of Florida, St. Augustine: Properties of the earliest nervous systems.

SESSION 2: Genes, Neural Patterning, and the Bilaterian Ancestor ("Stars and Stripes")
Chairperson: V. Hartenstein, University of California, Los Angeles

T. Gojobori, National Institute of Genetics, Shizuoka, Japan: Search for the evolutionary origin of the CNS: Comparative studies of gene expression in planarian and hydra neural cells.
V. Hartenstein, University of California, Los Angeles: *Drosophila* head structures compared with vertebrates: What does this reveal about the bilaterian ancestor?
H. Reichert, University of Basel, Switzerland: Origin of the tripartite bilaterian brain: Developmental genetic insights from *Drosophila*.
C.J. Lowe, University of California, Berkeley: The problems of reconstructing ancestral nervous systems from conserved patterning genes: Insights from hermichordates.
C. Nielsen, University of Copenhagen, Denmark: Apical organs and adult brains in protostomes and deuterostomes.
G. Scholtz, Humboldt University, Berlin, Germany: Levels of homology of nervous systems.

SESSION 3: Evolution of Cell Types: Genes for Neural Determination and Diversification ("Assembling the Team")
Chairperson: P. Lemaire, University of Marseille, France

L. Moroz, University of Florida, St. Augustine: Genomic approaches to the origin and evolution of the nervous system: Insights from molluscan neurogenomics.
P. Callaerts, University of Leuven, Belgium: Making neurons work: Insights from transcription factor–target gene studies.
D. Arendt, EMBL, Heidelberg, Germany: Tracing cell type diversification in nervous system evolution: A photoreceptor-centric view.
P. Lemaire, University of Marseille, France: Neural induction in chordates: An ancestral role for FGF as a neural inducer.
H. Wada, University of Tsukuba, Japan: Molecular evolutionary background for the innovation of the neural crest.

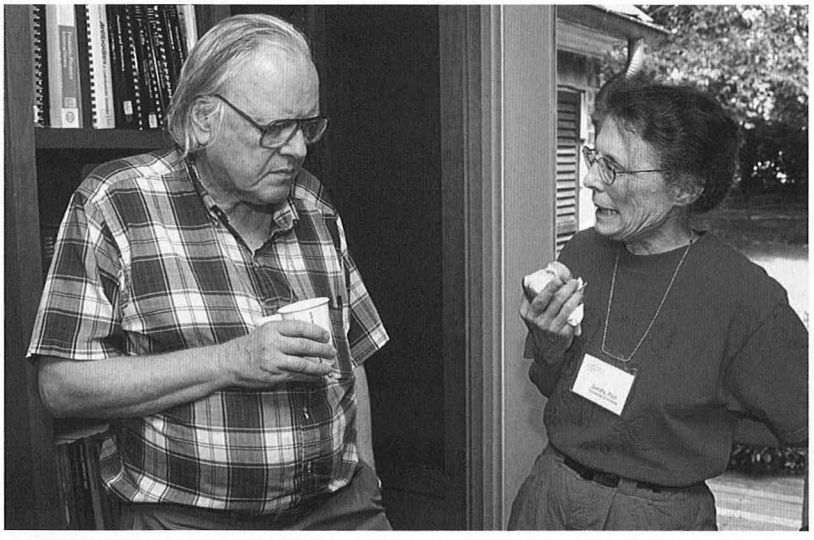
SESSION 4: The Chordate and Arthropod Progression ("Prometheus' Herald")
Chairperson: I.A. Meinertzhagen, Dalhousie University, Halifax, Nova Scotia

L. Holland, University of California, San Diego: Amphioxus and the evolutionary origins of the midbrain/hindbrain junction and neural crest.
S. Shimeld, University of Reading, United Kingdom: The evolutionary origin of vertebrate cranial sensory systems.
C. Ragsdale, University of Chicago, Illinois: Comparative molecular histology on the origins of the mammalian cerebral cortex.
N.J. Strausfeld, University of Arizona, Tucson: Using neural architectures to reconstruct evolutionary trajectories within the arthropods.
S. Harzsch, University of Ulm, Germany: Arthropod relationships: Linking brain architecture and phylogeny.
R.J. Greenspan, The Neuroscience Institute, San Diego, California: Arousal, attention, and the rudiments of consciousness in *Drosophila*.

SESSION 5: Evolution of Cells and Circuits "Nexus and Plexus"
Chairperson: M. Bate, University of Cambridge, United Kingdom

M. Bate, University of Cambridge, United Kingdom: Body plans and circuit diagrams for locomotor networks.
I.A. Meinertzhagen, Dalhousie University, Halifax, Nova Scotia: Cells, synapses, and circuits in the fly visual system: New circuits from old cells.
D.H. Paul, University of Victoria, Canada: How a real nervous system really evolved: Adding to, deleting from, and messing around with ancient neurobehavioral circuitry.
P.S. Katz, Georgia State University, Atlanta: Parallel, convergent, and divergent evolution of neural circuits in sea slugs.
D. Chklovskii, Cold Spring Harbor Laboratory: Why are neurons where they are? Why do neurons have the shape they do?

Overall General Discussion and Summary
Chairpersons: R.J. Greenspan, The Neuroscience Institute, San Diego, California; **H. Reichert,** University of Basel, Switzerland; **C. Nielsen,** University of Copenhagen, Denmark; **I.A. Meinertzhagen,** Dalhousie University, Halifax, Nova Scotia; **V. Hartenstein,** University of California, Los Angeles



H. Bourne, D. Paul

Integrating Disparate Data to Simulate Lymphocyte Function

September 19–22

FUNDED BY **Centers for Disease Control & Prevention**

ARRANGED BY **W.C. Reeves,** Centers for Disease Control & Prevention
S. Vernon, Centers for Disease Control & Prevention

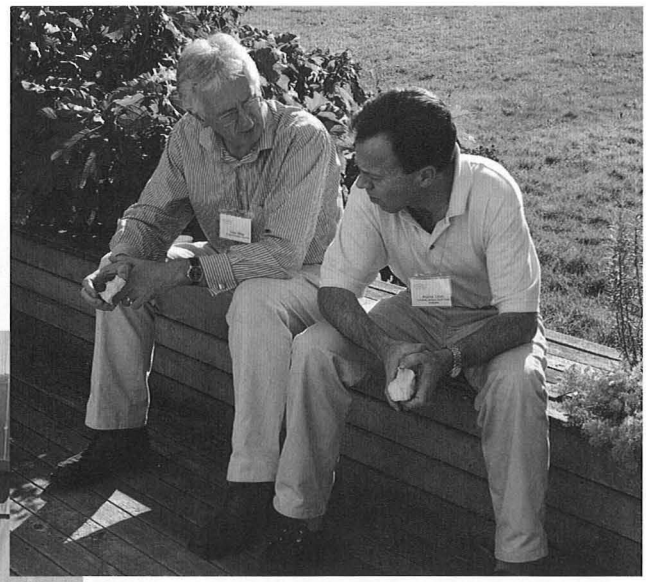
Introduction: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
S. Vernon, Centers for Disease Control & Prevention, Atlanta, Georgia

SESSION 1: Assessment of Normal Lymphocyte Function
Chairperson: U. Vollmer-Conna, University of New South Wales, Sydney, Australia

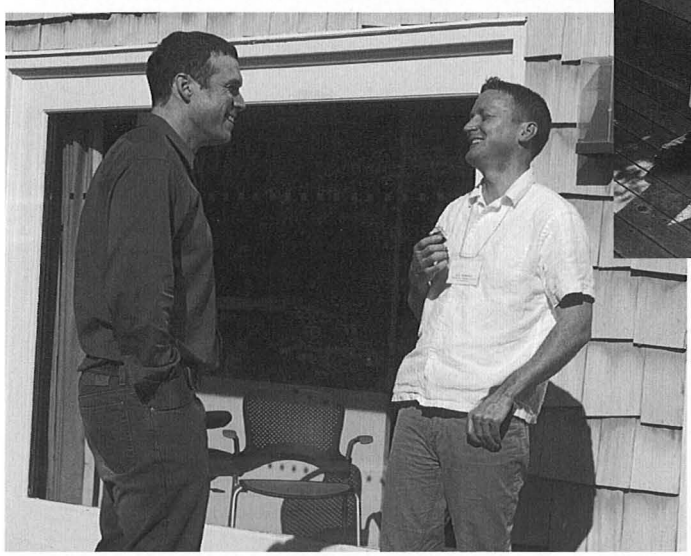
W.F. Hickey, Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire: Leukocyte trafficking in the CNS: Communication between the brain and the body.
A. Shaw, Washington University, St. Louis, Missouri: Mediating lymphocyte function via the immunological synapse.
M. Dustin, New York University School of Medicine, New York: Integrins and lymphocyte function.
M. Gunzer, German Research Centre for Biotechnology, Braunschweig, Germany: Dynamic imaging of immune cell migration.

SESSION 2: Lymphocyte Function in Persistent Infection
Chairs: P.D. White, St. Bartholomew's Hospital, London, United Kingdom

W.F. Hickey, Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire: Effect of persistent infection on leukocyte trafficking and function in the CNS.
A. Shaw, Washington University, St. Louis, Missouri: The immunological synapse of persistently infected lymphocytes.
M. Dustin, New York University School of Medicine, New York: Effect of persistent infection on integrin-mediated T-cell function.
R. Taylor, University of Illinois, Chicago: Stress and lymphocyte function.



P.D. White, A. Lloyd



S. Efroni, E. Alakson

SESSION 3: Managing and Integrating Disparate Data
Chairperson: A. Lloyd, University of New South Wales, Sydney, Australia

A.K. Chakraborty, University of California, Berkeley: Integrating in silico and in vitro experiments to study how T lymphocytes communicate.

W. Tong, FDA's National Center for Toxicological Research, Jefferson, Arkansas: Integrating disparate data sources with data mining and visualization to facilitating toxicogenomics research

T. Wymore, Pittsburgh Supercomputing Center, Pennsylvania: Integrating structural bioinformatics and molecular simulation for the prediction of protein structure and function.

L. You, California Institute of Technology, Pasadena: Integrated understanding of biological networks by modeling.

S. Efroni, National Institutes of Health/NIAID, Bethesda, Maryland: Exploring emergent complexity: Reactive animation of thymocyte development.

SESSION 4: Computer Models of Living Cells
Chairpersons: E. Aslakson, Centers for Disease Control & Prevention, Atlanta, Georgia;
B. Gurbaxani, Center for Disease Control & Prevention, Atlanta, Georgia

B. Geortzel, Biomind LLC, Wheaton, Maryland: Application of probabilistic inference and machine learning to lymphocyte function.

A. Rundell, Purdue University, West Lafayette, Indiana: Mathematical modeling and analysis of T-cell signaling.

J. Fostel, National Center for Toxicogenomics, Research Triangle Park, North Carolina: Object models for system biology data.

S. Kumar, DARPA, Information Processing Technology Office, Arlington, Virginia: Bio-SPICE: An informatics and simulation tool for cell processes.

G. Broderick, University of Alberta, Canada: A parallel particle-based approach to whole-cell modeling.

SESSION 5: Brainstorming Session
Chairperson: S. Vernon, Centers for Disease Control & Prevention, Atlanta, Georgia

Discussion with facilitators

- Is simulation of a lymphocyte feasible?
- Should the focus of simulation be on a lymphocyte function?
- What are the pros and cons of simulated models?
- Does the current CFS immune data implicate a cell type or function that could be simulated?
- Is there a need for wet-lab work to augment our knowledge of lymphocyte function?
- If so, what is the most likely place to start?
- What are the (other) requirements?

Report by facilitators

Concluding Summary

Training and Education in Medical Genetics

October 20–22

FUNDED BY **Participant Funding**

ARRANGED BY **B.R. Korf,** University of Alabama, Birmingham

Introduction: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory

Welcome and Overview of Meeting:
G. Feldman, Wayne State University, Detroit, Michigan
B.R. Korf, University of Alabama, Birmingham
G. Wiesner, Case Western Reserve University, Cleveland, Ohio

Introductions
Brief Presentations

SESSION 1

C. Epstein, University of California, San Francisco: History and rationale for current approach to medical genetics training.
G. Wiesner, Case Western Reserve University, Cleveland, Ohio: Number of accredited MD Clinical Geneticists over history of ABMG.
G. Feldman, Wayne State University, Detroit, Michigan: Number of current accredited medical genetics residencies.
M. Blitzer, University of Maryland, Baltimore: Workforce study.
B.R. Korf, University of Alabama, Birmingham: Goals of physician training in medical genetics and roles of various types of professionals.

C. Epstein, V. Proud

SESSION 2

G. Wiesner, Case Western Reserve University, Cleveland, Ohio: Obstacles and challenges being faced in attracting trainees, supporting their training, and positioning them in the field.
G. Feldman, Wayne State University, Detroit, Michigan: Propose approaches to overcome the obstacles and challenges noted above.

Discussion

SESSION 3:
Action items and planned follow-up

Pandemic Disease Threat: Can We Develop a Global Vaccine Policy?

October 24–26

FUNDED BY **Albert B. Sabin Vaccine Institute, with the support of the Bill and Melinda Gates Foundation**

ARRANGED BY **V. Korn,** Albert B. Sabin Vaccine Institute
D.D. Mason, Albert B. Sabin Vaccine Institute
L.A. Miller, Intermedica, Inc.

Tri-Chairs: **D. Heymann,** World Health Organization
A. Osterhaus, Erasmus University Medical Center
L.A. Miller, Intermedica, Inc.

Distinguished Visiting Scholar: J.M. Barry, The Center for Bioenvironmental Research at Tuland and Xavier Universities, Washington, D.C.: The great influenza: The epic story of the deadliest plague in history.

Introduction: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

Conference Co-Chairs: **D.L. Heymann,** World Health Organization, Geneva, Switzerland
L.A. Miller, Intermedica, Inc., Darien, Connecticut
A. Osterhaus, Erasmus University Medical Center, Rotterdam, The Netherlands: Charge to the Conference.

Keynote Speaker: B. Schwartz, National Vaccine Program Office, Atlanta, Georgia: Global pandemic disease threats.

SESSION 1: Source Recognition and Surveillance
Chairperson: A. Osterhaus, Erasmus University Medical Center, Rotterdam, The Netherlands

Panel

A. Osterhaus, Erasmus University Medical Center, Rotterdam, The Netherlands

M. Miller, Fogarty International Center, NIH, Bethesda, Maryland

K. Stohr, World Health Organization, Geneva, Switzerland

M.T. Osterholm, University of Minnesota Academic Health Center, Minneapolis

M. Miller, Fogarty International Center, NIH, Bethesda, Maryland, and K. Stohr, World Health Organization, Geneva, Switzerland: What are we looking for?

A. Osterhaus, Erasmus University Medical Center, Rotterdam, The Netherlands, and M. Osterholm, University of Minnesota Academic Health Center, Minneapolis: What constitutes adequate surveillance?

SESSION 2: Planning and Response to Pandemics: Coordination and Feasibility
Chairperson: K. Stohr, World Health Organization, Geneva, Switzerland

Panel
J.T. Matthews, Aventis Pasteur, Swiftwater, Pennsylvania
D. Salisbury, Skipton House, London, United Kingdom
J. LeDuc, Centers for Disease Control and Prevention, Atlanta, Georgia,
T. Tam, Health Canada, Ottawa, Ontario
B. Schwartz, National Vaccine Program Office, Atlanta, Georgia
J. LeDuc, Centers for Disease Control and Prevention, Atlanta, Georgia
D. Salisbury, Skipton House, London, United Kingdom: Is a functional plan for a vaccine response strategy reasonable and how quickly could such a plan be developed?
K. Stohr, World Health Organization, Geneva, Switzerland
B. Schwartz, National Vaccine Program Office, Atlanta, Georgia: Who takes the lead: How and why?
J.T. Matthews, Aventis Pasteur, Swiftwater, Pennsylvania, and T. Tam, Health Canada, Ottawa, Ontario: How do we involve industry in pandemic preparedness?

Open Discussion and Consensus

Recommendations

SESSION 3: Achieving Capacity and Forecasting Demand
Chairperson: D.L. Heymann, World Health Organization, Geneva, Switzerland

Panel
S. Jadhav, Serum Institute of India, Ltd., Pune, India
I. Raw, Instituto Butantan, San Paulo, Brazil
L.K. Gordon, VaxGen, Inc., Brisbane, California: Large-scale vaccine production.
S. Jadhav, Serum Institute of India, Ltd., Pune, India
L.K. Gordon, VaxGen, Inc., Brisbane, California: Large-scale vaccine production.
I. Raw, Instituto Butantan, San Paulo, Brazil: How can the developing countries manage if there is a pandemic?

Addressing Regulatory and Liability Concerns

Open Discussion and Consensus

Recommendations

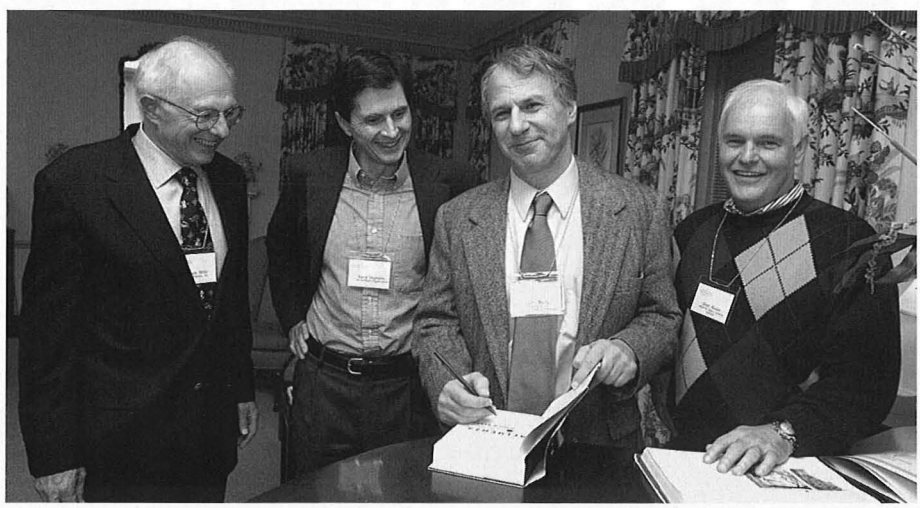
SESSION 4: Political and Economic Considerations on a Global Scale
Chairperson: J. LeDuc, Centers for Disease Control and Prevention, Atlanta, Georgia

Panel
C. Kang, NIH Korea, NIC Korea, Seoul, Korea
M.A. Chafee, The Harbour Group, Washington, D.C.
O. de Oliva, Pan American Health Organization, Washington, D.C.
S. Hall, UNICEF Plads, Copenhagen, Denmark
O. de Oliva, Pan American Health Organization, Washington, D.C.
C. Kang, NIH Korea, NIC Korea, Seoul, Korea: Building a plan inclusive of developing countries.
S. Hall, UNICEF Plads, Copenhagen, Denmark
M.A. Chafee, Harbour Group, Washington, D.C.: Establishing political commitment (disclosure, aid, etc.)

Open Discussion and Consensus

Recommendations

Conference Wrap Up/Next Steps from Here
L.A. Miller, Intermedica, Inc., Darien Connecticut



L.A. Miller, D. Heymann, J. Barry, D. Mason

The Biology of Neuroendocrine Tumors

October 26–29

FUNDED BY **The Verto Institute**

ARRANGED BY **A.J. Levine,** Institute for Advanced Study
E. Vosburgh, Verto Institute

Introduction: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
E. Vosburgh, Verto Institute, Stamford, Connecticut: Verto activities to date.

SESSION 1: Genetics and Epigenetics in Neuroendocrine Tumors
Chairperson: A.J. Levine, Institute for Advanced Study, Princeton, New Jersey

C. Harris, Verto Institute, Princeton, New Jersey: The potential role of LINE1 retrotransposons in genomic instability of human tumors.

A. Levine, Institute for Advanced Study, Princeton, New Jersey: SNPS in the *p53* pathway.

A. Rashid, MD Anderson Cancer Center, Houston, Texas: Genetic and epigenetic alterations in neuroendocrine tumors.

R.V. Lloyd, Mayo Clinic, Rochester, Minnesota: Epigenetic regulation of protein expression in carcinoid tumors.

SESSION 2: Whole-genome Studies of Neuroendocrine Tumors
Chairperson: M.L. Meyerson, Dana Farber Cancer Institute, Boston, Massachusetts

B.T. Teh, Van Andel Research Institute, Grand Rapids, Michigan: Genetic studies of HPRT2 and its clinical implications.

D.C. Chung, Massachusetts General Hospital, Boston: Gene expression arrays in pancreatic neuroendocrine and GI carcinoid tumors.

P. Dahia, Dana Farber Cancer Institute, Boston, Massachusetts: Genome-wide approaches to a hereditary tumor model: potential for gene discovery and identification of novel signaling interactions in pheochromocytomas.

M.L. Meyerson, Dana Farber Cancer Institute, Boston, Massachusetts: Systemic genome analysis of cancer by SNP arrays and exon sequencing.

SESSION 3: Animal Models of Neuroendocrine Tumors
Chairperson: J.A. Epstein, University of Pennsylvania, Philadelphia

S.K. Kim and S. Karnik, Stanford University School of Medicine, California: Disrupted islet cell growth and differentiation in mouse genetic models.

K. Pietras, University of California, San Francisco: A multitargeted, metronomic, and MTD "chemo-switch" regimen is anti-angiogenic, producing objective responses

and survival benefit in a mouse model of neuroendocrine cancer.

Y. Xiong, University of North Carolina, Chapel Hill: *p18* double mutants.

T. Look and J. Kanki, Dana Farber Cancer Institute, Boston, Massachusetts: Targeted expression of MYCN selectively causes pancreatic neuroendocrine tumors in transgenic zebrafish.

Discussion: Key Points from the Day

A.J. Levine, Institute for Advanced Study, Princeton, New Jersey, and **Evan Vosburgh,** Verto Institute, Stamford, Connecticut

SESSION 4: Clinical Updates
Chairperson: J. Yao, Gastrointestinal Medical Oncology, Houston, Texas

M.H. Kulke, Dana Farber Cancer Institute, Boston, Massachusetts: Targeted therapies in the treatment of neuroendocrine tumors.

J. Yao, Gastrointestinal Medical Oncology, Houston, Texas: Developing targeted strategies for neuroendocrine carcinoma.

L. Kvols, University of South Florida, Tampa: An update on radiolabeled peptides as therapy for carcinoid and islet cell carcinomas.

Group discussion: Is there a need for a U.S.-based cooperative group for carcinoid and NET?

SESSION 5: Neuroendocrine Cell Biology
Chairperson: S.K. Kim, Stanford University School of Medicine, California

M.L. Meyerson, Dana Farber Cancer Institute, Boston, Massachusetts: Menin is associated with a histone methyltransferase complex.

X. Hua, University of Pennsylvania, Philadelphia: Regulation of apoptosis by menin.

S.K. Kim, Stanford University School of Medicine, California: Regulators of islet cell growth and differentiation.

SESSION 6: Carcinoid Tumor Biology
Chairperson: R.V. Lloyd, Mayo Clinic, Rochester, Minnesota

R.V. Lloyd, Mayo Clinic, Rochester, Minnesota: EGFR studies in carcinoid tumors.

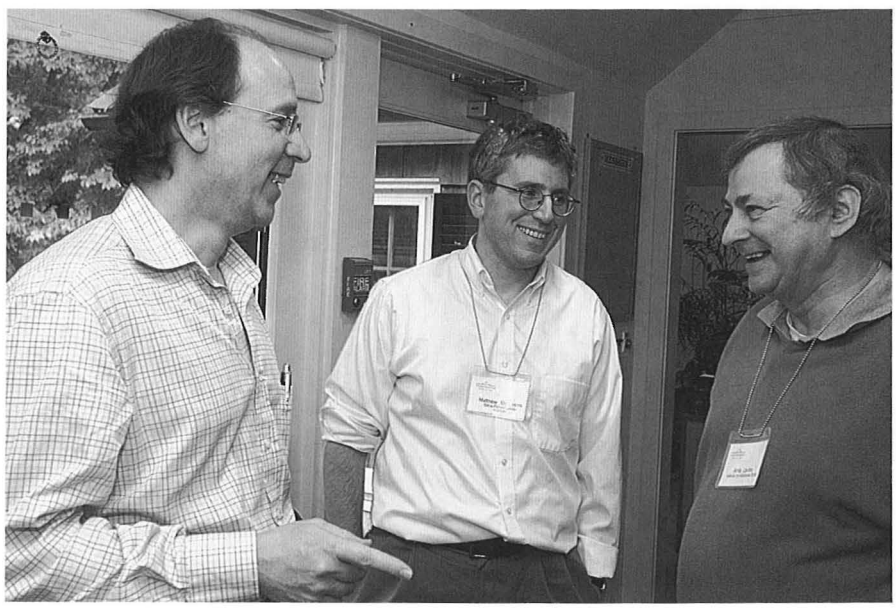
G. Friberg, University of Chicago, Illinois: c-*met*, p-*met* status of carcinoid tumors.

M.H. Kulke, Dana Farber Cancer Institute, Boston, Massachusetts: VEGF, VEGFR, EGFR, c-Kit, P-Kit, and CD31 studies of carcinoid tissue microarrays.

M. Essand, Uppsala University, Sweden: Gene expression in midgut carcinoid tumors: Potential targets for immunotherapy.

F. Leu, Verto Insititute, Princeton, New Jersey: Antibodies to extracellular region of hSSTR antibodies1-5.

SESSION 7: Review and Group Discussion led by Session Chairs



J. Sackler, M. Meyerson, A. Levine

Chromatin Remodeling and Gene Expression in Male Germ Cells

November 14–17

FUNDED BY **Cold Spring Harbor Laboratory Corporate Sponsor Program**

ARRANGED BY **P. Sassone-Corsi,** Institut de Genetique et de Biologie Moleculaire et Cellulaire**,** Illkirch, France

Introduction: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
P. Sassone-Corsi, Institut de Genetique et de Biologie Moleculaire et Cellulaire, Illkirch, France

SESSION 1: Nuclear Organization

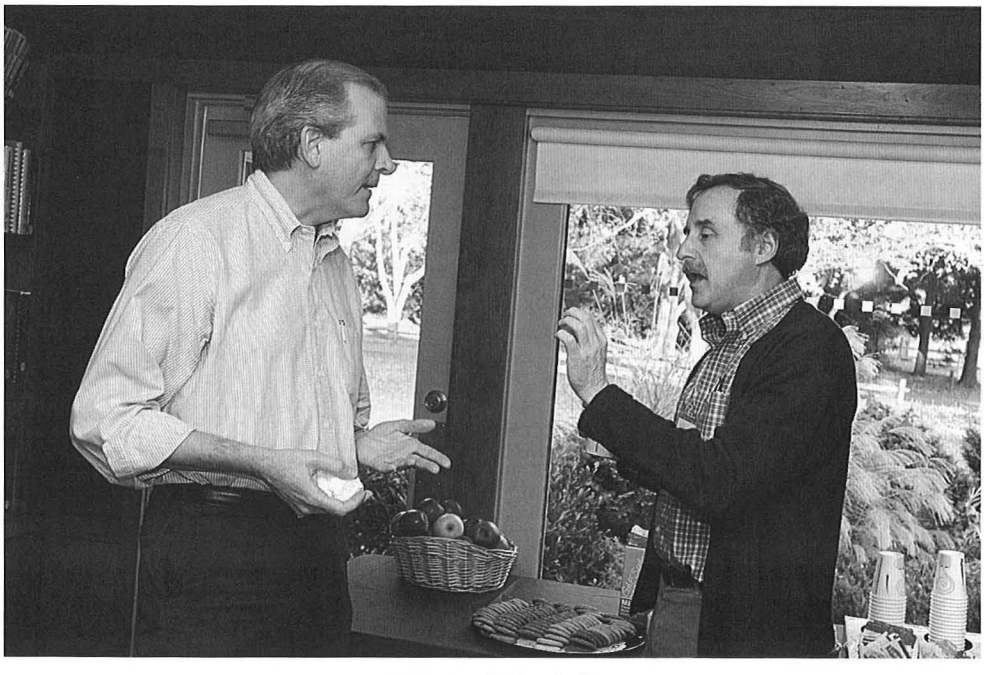
D. Spector, Cold Spring Harbor Laboratory: An overview of nuclear organization.
R. Camerini-Otero, National Institute of Diabetes and Digestive and Kidney Diseases, NIH, Bethesda, Maryland: The mammalian sex body: What is required to form it and what is its role on the evolution of the X chromosome?
P. Moens, York University, Toronto, Canada: Immunocytological and FISH analysis of meiotic chromosome core, their associated proteins, and chromatin loop organization.

SESSION 2: Signaling

M. Matzuk, Baylor College of Medicine, Houston, Texas: Chromatin and germ-cell biology.
R.E. Braum, University of Washington, Seattle: Androgen regulation of mammalian spermatogenesis.

SESSION 3: Chromatin and Epigenetics

S. Henikoff, Fred Hutchinson Cancer Research Center, Seattle, Washington: Histone variants and nucleosome assembly pathways.
A. Nussenzweig, National Cancer Institute, NIH, Bethesda, Maryland: Chromatin remodeling mediated by histone H2AX
I. Davidson, Institut de Genetique et de Biologic Moleculaire et Cellulaire, Illkirch, France: Specialization of the general transcription apparatus and chromatin components in male germ cells.
M.L. Meistrich, University of Texas/M.D. Anderson Cancer Center, Houston: Abnormal chromatin remodeling in transition protein knockout mice.
P.S. Burgoyne, MRC National Institute for Medical Research, London, United Kingdom: The modulation of *X* and *Y* gene in meiosis and spermiogenesis in the mouse.



T. Bestor, S. Henikoff

SESSION 4: Epigenetics and Meiosis

P. Sassone-Corsi, Institut de Genetique et de Biologic Moleculaire et Cellulaire, Illkirch, France: Signaling through aurora kinases in germ cells.
C. Hoog, Karolinska Institutet, Stockholm, Sweden: Organization of the mammalian meiotic chromosome axes.
J. Schimenti, Cornell University, Ithaca, New York: Novel meiotic mutants in mice recovered by random mutagenesis.
T.H. Bestor, Columbia University: Irreversible gene silencing in the male germ line.
J. Trasler, Montreal Children's Hospital Research Institute, Montreal, Canada: Establishing, maintaining, and perturbing DNA methylation patterns in the male germ line.

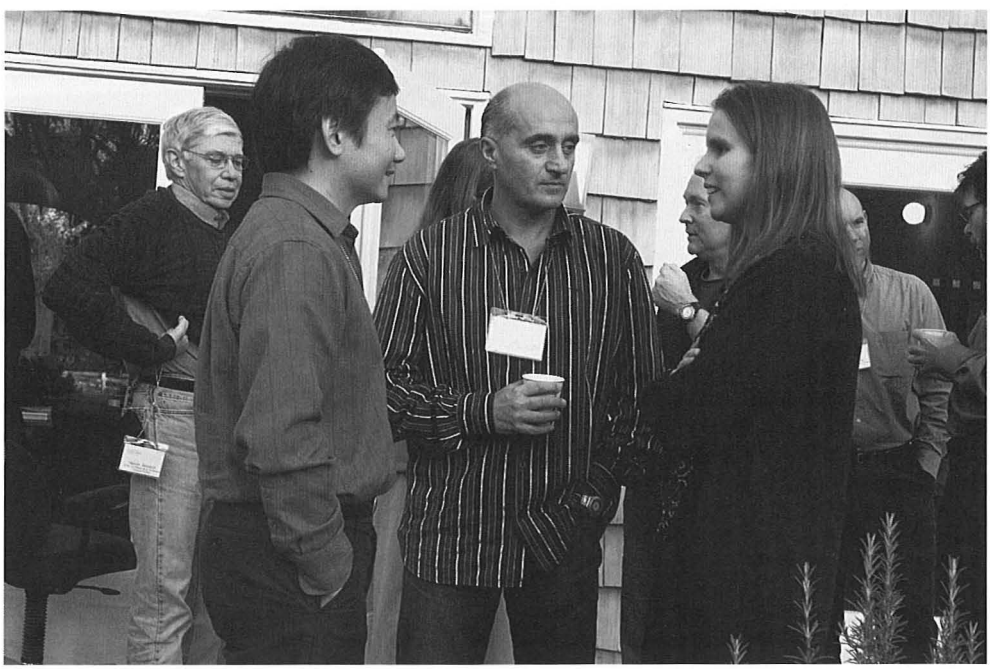
SESSION 5: Mechanisms of Gene Expression

M.A. Handel, The Jackson Laboratory, Bar Harbor, Massachusetts: Chromatin correlates of meiotic transcriptional activity.
M.T. Fuller, Stanford University School of Medicine, California: Regulation of the primary spermatocyte transcription program by tissue-specific TAFs.
M. Wilkinson, University of Texas/M.D. Anderson Cancer Center, Houston: Alternative promoters insulated by tissue-specific DNA methlation boundaries.
D.J. Wolgemuth, Columbia University Medical Center: Mutation of the testis-specific bromodomain-containing gene *Brdt* results in defects in the differentiation of spermatid nuclei and male sterility.
H. Lin, Duke University Medical Center, Durham, North Carolina: Role of Piwi/Argonaute family proteins in gametogenesis.

SESSION 6: Repair Systems

A. Grootegoed, Erasmus University Rotterdam, The Netherlands: Ubiquitin ligase Rad18Sc to the XY body and to other chromosomal regions that are unpaired and transcriptionally silenced in male meiotic prophase.
A. Shinohara, Osaka University, Japan: Role of Rad6-Bre1-mediated histone H2B ubiquitylation in the formation of double-strand breaks during meiotic recombination.
D. Georgia De Rooij, Utrecht University, The Netherlands: Repair gene expression during meiosis and spermatogenic arrests in deficient animals.

Review and Group Discussion



M. Meistrich, H. Lin, P. Sassone-Corsi, N. Kortaja

New Insights into Viral Disease from Mathematical Modeling of Biological Systems

December 5–8

FUNDED BY **Institute for Comparative Genomics**

ARRANGED BY **R. Breeze,** Institute for Comparative Genomics
L. Horn, Institute for Comparative Genomics
W. Laegreid, USDA Agricultural Research Service
D. Rock, USDA Agricultural Research Service

Introduction: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
R. Breeze, Institute for Comparative Genomics, Washington, D.C.: Why this meeting?

SESSION 1: Problems in Viral Pathogenesis
Chairperson: D.L. Rock, University of Connecticut, Storrs

A. Alcami, Centro Nacional de Biotecnologia, Madrid, Spain
B.L. Jacobs, Arizona State University, Tempe
P.B. Jahrling, U.S. Army Medical Research Institute of Infectious Diseases, Frederick, Maryland
G. Letchworth, USDA, Agricultural Research Service, ABADRL, Laramie, Wyoming
E.S. Mocarski, Stanford University School of Medicine, California

Group Discussion

SESSION 2: Modeling Biological Systems
Chairperson: W.D. Wilson, Lawrence Livermore National Laboratory, California

H. Bolouri, Institute for Systems Biology, Seattle, Washington
P. Ghazal, University of Edinburgh Medical School, United Kingdom
P.C. Johnson, Icoria, Inc., Research Triangle Park, North Carolina
J. Rose, University of South Carolina, Columbia
C.M. Schaldach, Lawrence Livermore National Laboratory, California
W.D. Wilson, Lawrence Livermore National Laboratory, California

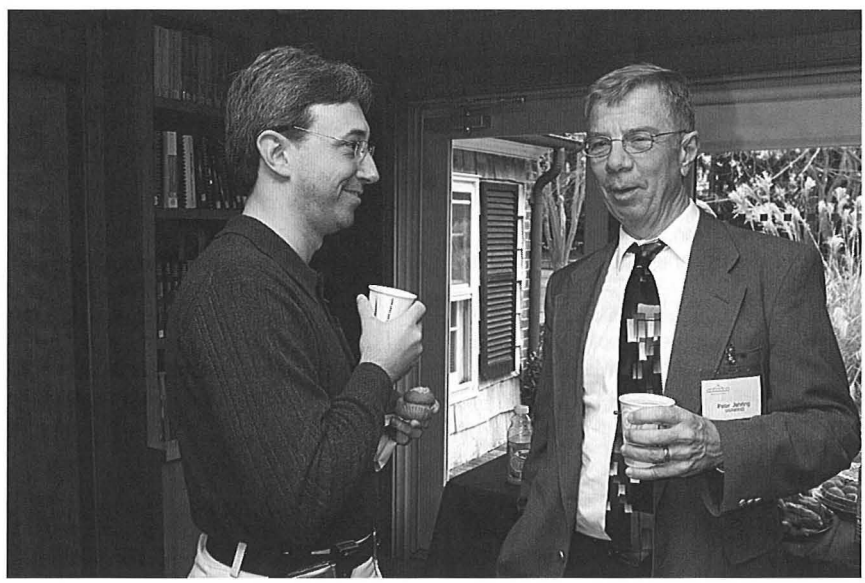
Group Discussion

SESSION 3: Modeling Virus Systems
Chairperson: W. Laegreid, Agricultural Research Service, Clay Center, Nebraska

R.A. Arnaout, Brigham & Women's Hospital, Harvard Medical School, Chestnut Hill, Massachusetts
R. Asquith, Imperial College, London, United Kingdom
N.M. Ferguson, Imperial College London, United Kingdom
A. Perelson, Los Alamos National Laboratory, New Mexico
R.J. Srivastava, University of Connecticut, Storrs
L. Weinberger, Berkeley, California

SESSION 4: Discussion of Research Needs/Opportunities/Challenges

SESSION 5: The Way Forward
Chairperson: R. Breeze, Institute for Comparative Genomics, Washington, D.C.



C. Cooke, P. Jahrling

Bioinformatic Strategies for the Epigenome

December 12–15

FUNDED BY **Cold Spring Harbor Laboratory Corporate Sponsor Program**

ARRANGED BY **D.P. Barlow,** Center of Molecular Medicine GmbH of the Osterreischische Akademie der Wissenschaften
R. Martienssen, Cold Spring Harbor Laboratory

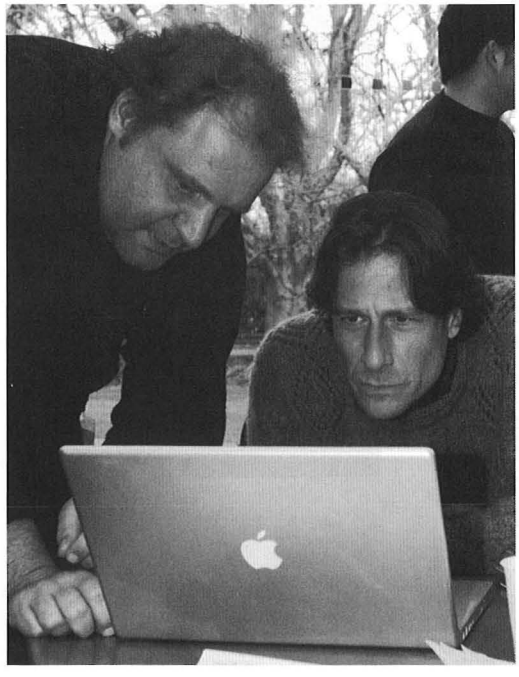
INTRODUCTION: **J.A. Witkowski,** Banbury Center, Cold Spring Harbor Laboratory
D.P. Barlow, Center of Molecular Medicine GmbH of the Osterreischische Akademie der Wissenschaften and
R. Martienssen, Cold Spring Harbor Laboratory: Goals of Meeting: What are the key issues for integrating epigenetic data and bioinformatics?

SESSION 1
Chairperson: D.P. Barlow, Center of Molecular Medicine GmbH of the Osterreischische Akademie der Wissenschaften

R. Martienssen, Cold Spring Harbor Laboratory: Transposons, tandem repeats, and small interfering RNA in *Arabidopsis* heterochromatin.
S. Beck, The Sanger Institute, Cambridge, United Kingdom: The human epigenome project: The pilot.
S. Eddy, HHMI/Washington University School of Medicine, St. Louis, Missouri: Computational methods for noncoding RNA structure and sequence analysis.
J. Walter, Saarland University, Saarbrucken, Germany: Comparative genomics and epigenomics.
X. Cheng, Emory University School of Medicine, Atlanta, Georgia: The chemistry of methylation: How many methyl groups are needed?
L. Joshua-Tor, Cold Spring Harbor Laboratory: Argonaute: The secret life of Slicer.
A. Neuwald, Cold Spring Harbor Laboratory: Using statistically inferred evolutionary constraints on protein sequences to predict epigenetic mechanisms.

SESSION 2
Chairperson: T.R. Gingeras, Affymetrix, Santa Clara, California

L. Ringrose, University of Heidelberg, Germany: Bioinformatic prediction of polycomb response elements in flies and vertebrates.
H. Stunnenberg, University of Nijmegen, The Netherlands: Functional genomics: Deciphering gene regulatory networks by Mass Spec and ChIP-chip.
J. Lieb, University of North Carolina, Chapel Hill: Nucleosome dynamics and transcription factor target selection in yeast.
B.D. Dynlacht, New York University School of Medicine, New York: Understanding mammalian cell cycle control and differentiation on a genome-wide scale.
G. Karpen, University of California, Berkeley: Epigenetics and chromosome functions.
W.G. Kelly, Emory University, Atlanta, Georgia: Homology pairing effects, genome defense, and sex chromosome evolution in *C. elegans*.



J. Walter, G. Karpen

SESSION 3
Chairperson: S. Eddy, HHMI/Washington University School of Medicine, St. Louis, Missouri

T.H. Bestor, Columbia University, New York: Global structure of genomic methylation patterns.
R. Lucito, Cold Spring Harbor Laboratory: Microarray-based approaches to global methylation detection.

J. Jurka, Genetic Information Research Institute, Mountain View California: CpG decay in *Alu* repeats: Germ-line-specific differences.

H.H. Kazazian, University of Pennsylvania School of Medicine, Philadelphia: Biology of mammalian retrotransposons.

S.R. Wessler, University of Georgia, Athens: Genome-wide analysis of transposable element-mediated alterations in rice gene expression.

R.W. Doerge, Purdue University, West Lafayette, Indiana: Mapping gene regulation: QTLs and microarrays.

T.R. Gingeras, Affymetrix, Santa Clara, California: Evidence of hidden transcriptome: Architecture and possible regulatory region.

SESSION 4
Chairperson: R. Martienssen, Cold Spring Harbor Laboratory

V. Colot, Unite de Recherche en Genomique Vegetale, Cremieux, France: Building *Arabidopsis* epigenomic maps.

A. Ferguson-Smith, University of Cambridge, United Kingdom: Epigenetic features of a 2-Mb imprinted domain in mouse: A small piece of a bigger picture.

B. van Steensel, Netherlands Cancer Institute, The Netherlands: Chromatin mapping by DamID in flies and humans.

S. Kurdistani, University of California School of Medicine, Los Angeles: Mapping global patterns of histone acetylation to gene expression.

J. Martens, Research Institute of Molecular Pathology, Vienna, Austria: An epigenetic map of the mouse genome.

D.P. Barlow, Center of Molecular Medicine GmbH of the Osterreischische Akademie der Wissenschaften: ChIP on Chip histone profiling using mouse genome path arrays.

Discussion: Global epimapping strategies technical applications.

SESSION 5
Chairperson: H.H. Kazazian, University of Pennsylvania School of Medicine, Philadelphia

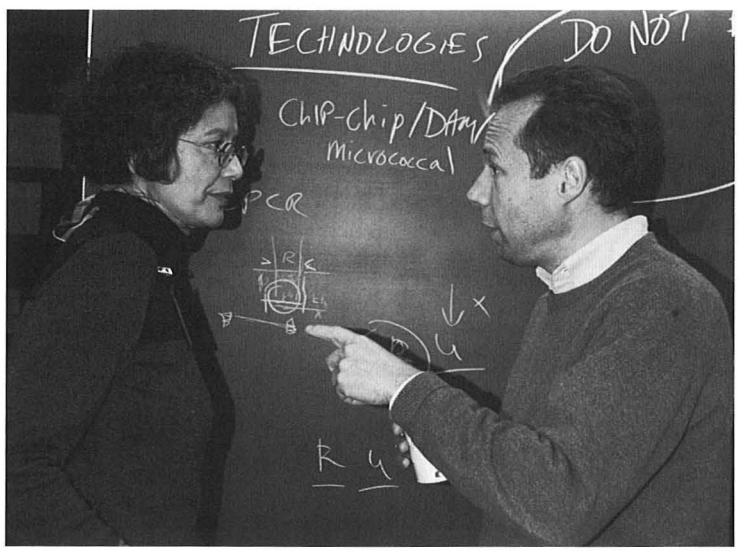
L.D. Stein, Cold Spring Harbor Laboratory: Database strategies for interconnecting biological pathways with the genome.

N. Brockdorff, Hammersmith Hospital, London, United Kingdom: Development of a genome environment browser for linking epigenetics and genomics.

R. Jorgensen, University of Arizona, Tucson: The Plant Chromatin Database: Integrating information on plant chromatin components and complexes.

M. Vaughn, Cold Spring Harbor Laboratory: Mapping the epigenotic potential of *Arabidopsis*.

Summary/Further Action
Moderators: D.P. Barlow, Center of Molecular Medicine GmbH of the Osterreischische Akademie der Wissenschaften; **R. Martienssen,** Cold Spring Harbor Laboratory



D. Barlow, V. Colot

BANBURY CENTER GRANTS

Grantor	*Program/Principal Investigator*	*Duration of Grant*	*2004 Funding*+
FEDERAL SUPPORT			
Centers for Disease Control and Prevention (CDC)	Integrating Disparate Data to Stimulate Lymphocyte Function	2004	$ 45,000*
NIH–National Institute of Mental Health (through a grant to University of Illinois)	New Pharmacological Approaches to the Treatment of Fragile X	2004	35,441*
U.S. Department of Homeland Security (through a grant to UMDNJ–New Jersey Medical School	Microbial Forensics	2004	50,000*
NONFEDERAL SUPPORT			
Meeting Support			
Den Haag Foundation	Breast Cancer Research: A Critical Review for Future Strategies	2004	12,500*
Institute for Comparative Genomics	New Insights into Viral Disease from Mathematical Modeling of Biological Systems	2004	42,765*
Albert B. Sabin Vaccine Institute, Inc. (with the support of the Bill & Melinda Gates Foundation)	Pandemic Disease Threat: Can We Develop A Global Vaccine Policy?	2004	42,595
Alfred P. Sloan Foundation	Communication in Brain Systems	2004	16,000*
Spinal Muscular Atrophy Foundation	Spinal Muscular Atrophy: What is the Molecular Basis of Neuron Loss?	2004	41,403*
The Swartz Foundation	Communication in Brain Systems	2004	17,656*
Verto Institute, LLC	The Biology of Neuroendocrine Tumors	2004	43,244*

+Includes direct and indirect costs.
*New grants awarded in 2004.

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