BANBURY CENTER
DIRECTOR'S REPORT

The Banbury Center continues to be used throughout the year, with the exception of the few weeks during the depth of the winter. There were 24 meetings in 2002 and Laboratory scientists used the Center for four group meetings. The Watson School of Biological Sciences held two week-long "Topics in Biology" courses, and there were the usual five neuroscience lecture courses. Finally, two local groups made use of the Center.

There were 654 participants in Banbury Center meetings, 75% of whom came from the United States, drawn from 36 states. As usual, New York, Maryland, California, and Massachusetts supplied most visitors; these four states accounted for almost 50% of the U.S. participants. 164 visitors came from around the world—from no fewer than 22 countries, demonstrating the high international reputation of the Center.

The topics for the meetings were varied as always, although this year, the program was largely concerned with genetics and cancer, and there were fewer neuroscience meetings than usual.

Genomics

Banbury Center's 24 years encompasses the revolution in human genetics brought about by gene mapping and sequencing. Now, with the human genome sequence available for nucleotide-by-nucleotide examination, new strategies should be devised to exploit this remarkable resource. Sequenced-based Disease Gene Hunts, organized by Aravinda Chakravarti (April 28–May 1), discussed how this might be done. It is especially important for complex traits such as schizophrenia or asthma, where progress has been slow using standard family linkage methods. New tools that allow the scanning of the entire genome, for expression differences or sequence variation, promise to change this situation.

The impact of genome sequences is not limited, of course, to human beings. Plant scientists have been at the forefront of sequencing efforts, and crop geneticists are making intensive use of the data. John Doebley and Antoni Rafalski organized the meeting Sequence Diversity in Crop Plants: Results.
ly vulnerable in the different diseases? Answers were not found at the meeting, but new collaborations were fostered.

Gene Therapy

It is not often that a Banbury Center meeting attracts the attention of *Sports Illustrated*, but the meeting, *Genetic Enhancement of Athletic Performance* (Ted Friedmann, Gary Wadler, and Jan Witkowski; March 17–20), did so. Gene therapy has yet to live up to its promise, and it has suffered repeated setbacks, most recently the development of leukemia in children treated with retroviral vectors. However, the pressures and financial rewards of success in sport are so great that athletes may use gene therapy to introduce “desirable” performance-promoting genes while ignoring the dangers of gene therapy. Participants in this meeting, funded by the World Anti-Doping Agency (WADA), reviewed the current means by which athletes use medical treatments to promote performance and the current state of gene therapy, and discussed the future risks. It was hoped that the meeting would assist in the development of appropriate policy to anticipate and regulate extension of genetic therapy techniques and other emerging technologies to sports. The meeting was followed by a press conference in the New York City.

Infectious Diseases

Two meetings were prompted by the heightened awareness of the dangers of biological terrorism. The first, organized by Bud Mishra, was called *Designer Molecules for Biosensor Applications* (August 12–14) and discussed the potential of current state-of-the-art and possible short-term and long-term technology for rapid detection of pathogenic microorganisms. The relative merits of various technologies, based on genomic expression (mRNA), genome structure (DNA/RNA), protein structure, and other physical and geometric properties, were reviewed. Participants discussed the requirements of sensors for an advanced warning system against a biochemical attack, quick diagnosis of bio-warfare agents involved in the attack, and the forensics needed to determine the source of the attack.

The second meeting, *Microbial Forensics* (Steven Schutzer, Bruce Budowle, and Roger Breeze; November 10–13) was, in some ways, a descendant of the historic Banbury Center meeting on DNA fingerprinting held in 1989. Indeed, some of the participants in this meeting had been here in 1989. Participants discussed how to detect and identify pathogens, in particular using what might be called DNA signatures for pathogens. The meeting was initiated in part by new legislation that will change dramatically how certain dangerous pathogens are handled in the United States and that will subject academic laboratories to special physical, personnel, and pathogen security measures. The meeting was notable for the mix of scientists from academia and from government agencies—it set a new record for the number of acronyms appearing in a program.

The third meeting on infectious diseases—*Phage Therapy: Potential and Challenges* (Janskiaraman Ramachandran, Gary Schoolnik, and Suresh Subramani; November 13–15)—discussed an antibacterial strategy that has been available for more than 80 years. Bacteriophages are viruses that attack bacteria, and their use as antibacterial agents was urged by Félix d’Herelle, codiscoverer, with Frederick Twort, of bacteriophage in the early part of the 20th century. However, phage therapy was ineffective because of the poor understanding of the biology of phages, especially their specificity, by the early practitioners. Recent global emergence of antibiotic-resistant bacterial pathogens, especially in hospitals, has led to the reevaluation of the potential of bacteriophages for the treatment of these infections. Phage therapy also has enormous potential for medical care in the developing world.

Cancer

The four meetings on cancer ranged from fundamental research through clinical trials of therapeutics to an evaluation of possible therapies. *Cell Immortalization and Transformation* (Gordon Peters and
come to experience these most personal experiences.

Brain imaging studies, experiments, and phenomenology of emotion, all attempting to understand how we experience emotion, could provide insights into neurobiological and neuropsychological aspects of emotion. The burgeoning interest in emotion research, including depression, anxiety, and aspects of drug addiction, is now a major field of research. The neurobiological, genomics, and other areas of emotion research provide all aspects of emotion and behavior and can advance our understanding of emotion. Understanding the neural and psychopharmacological basis of processes to the highest levels of psychology. Understanding the neural and psychopharmacological basis of emotion can promote new research.

Neuroscience

Sections drawn from these different fields can help promote new research.

The system responsible for generating emotions is a complex process that involves a network of brain areas. It is now clear that emotions are not simply reactions. 

Developing a meeting on Oxidases in Neurotransmission and Behavior

GrayDock and the National Academy of Sciences are organizing a meeting on the role of oxidases in neurotransmission and behavior.

Taylor House provides housing accommodations for meeting participants at Durley Centre.
MEETINGS

DNA Interactive Advisory Panel

January 17–19

FUNDED BY Howard Hughes Medical Institute

ARRANGED BY D. Micklos, Dolan DNA Learning Center, Cold Spring Harbor Laboratory
J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory

SESSION 1

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory: Welcome and procedures.
D. Micklos, Dolan DNA Learning Center, Cold Spring Harbor Laboratory: Purpose and overview of the Genetic Journey/ DNAI project.

Introductions: Participants, CSHL, HHMI, Windfall Films Ltd., and RGB Company Ltd.

P. Bruns and D. Liu, Howard Hughes Medical Institute, Chevy Chase, Maryland: Funding perspective and DNAI mini-courses.
J.D. Watson, Cold Spring Harbor Laboratory: Genetic Journey, evolution of the project, thoughts in the DNA structure, and key points of the series.
D. Micklos, Dolan DNA Learning Center, Cold Spring Harbor Laboratory: Concept for DNAI.

SESSION 2

D. Micklos and DNAI Staff, Dolan DNA Learning Center, Cold Spring Harbor Laboratory: Tour of Dolan DNAI.
D. Micklos and DNAI Staff, Dolan DNA Learning Center, Cold Spring Harbor Laboratory: Discussion of DNAI template and Technology I.

Exploration of Innovative WWW Sites and Technology

D. Micklos and DNAI Staff, Dolan DNA Learning Center, Cold Spring Harbor Laboratory: Discussion of DNAI template and Technology II.

SESSION 3

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory: Introduction to five content areas of Genetic Journey.

Small Group Brainstorming on Five Content Areas, Concepts, and Innovative Approaches

Summary of group findings
Next Steps: WWW Site as Interaction Tool and Summer Internships

Dolan DNALC Focus Group
SESSION 3: Invertebrate Model Systems
Chairperson: R.R. Kopito, Stanford University, California

M. Feany, Brigham and Women's Hospital, Boston, Massachusetts: Fly models for neurodegeneration.
L.M. Thompson, University of California, Irvine: Therapeutic implications of transcriptional dysregulation and aggregation in HD.
R.I. Morimoto, Northwestern University, Evanston, Illinois: Stressing worms by polyglutamines: Effects of aging on aggregation and toxicity.
C. Link, University of Colorado, Boulder: β amyloid-chaperone interactions in a transgenic C. elegans model.

SESSION 4: Vertebrate Model Systems
Chairperson: L.M. Thompson, University of California, Irvine

S.B. Prusiner, University of California, San Francisco: Transgenic studies of prion diseases.
M. Hutton, Mayo Clinic, Jacksonville, Florida: Tau in neurodegenerative disease.
C.A. Ross, Johns Hopkins University School of Medicine, Baltimore, Maryland and Huntington's disease Society of America: Polyglutamine pathogenesis: Proteolysis, aggregation, and transcription.
J.D. Rothstein, Johns Hopkins University School of Medicine, Baltimore, Maryland: Astroglia, glutamate, and transporters: Pathway for cell death and target for neuroprotection.

SESSION 5: Models and Therapeutics
Chairperson: J.D. Rothstein, Johns Hopkins University School of Medicine, Baltimore, Maryland

K. Duff, Nathan Kline Institute, Orangeburg, New York: Sequstration of peripheral A-beta as a therapeutic approach.
D.R. Borchelt, Johns Hopkins Medical Institutions, Baltimore, Maryland: Protein aggregation in neurodegenerative disease.
Q. Liu, Harvard Medical School, Boston, Massachusetts: Chemical screens for compounds that affect mutant SOD1-induced aggresome formation.
P.T. Lansbury, Brigham and Women's Hospital, Boston, Massachusetts: From Parkinson's genes to new therapeutic strategies.
SESSION 4: In Vivo: Laboratory Experiments I
Chairperson: M.S. O'Reilly, MD Anderson Cancer Center, Houston, Texas

B.D. Ackley, University of California, Santa Cruz: The C. elegans homologue of collagen XVIII/endostatin regulates aspects of cell motility and neurogenesis.
F. Bertolini, European Institute of Oncology, Milan, Italy: Effect of endostatin on mobilization, clonogenic potential, and differentiation of endothelial progenitors.
O. Käker, University Hospital Marburg, Germany: Continuous administration of endostatin improves the efficacy and potency of therapy in a mouse xenograft tumor model.
S. Soker, Children's Hospital, Boston, Massachusetts: Novel functions of endostatin, or what have we missed in vitro that can explain the antitumor activity of endostatin in vivo.
M.R. Passos-Bueno, Universidade de Sao Paulo, Sao Paulo, Brazil: Characterization of novel SNPs (single nucleotide polymorphisms) in endostatins derived from collagens XV and XVIII and their impact in the susceptibility of cancer.

SESSION 5: In Vivo: Laboratory Experiments II
Chairperson: H.M. Pinedo, VU Medical Center, Amsterdam, The Netherlands

K. Moulton, Children's Hospital, Boston, Massachusetts: Endostatin inhibition of angiogenesis in atherosclerotic plaques.
B. Fenton, University of Rochester Medical Center, New York: Disparate effects of endostatin on tumor vascular perfusion and hypoxia in two murine mammary carcinomas.
R. Bjerkvig, University of Bergen, Norway: Delivery of endostatin to brain tumors from engineered cells encapsulated in alginate.
S. Libutti, National Cancer Institute, Bethesda, Maryland: Antiangiogenic gene therapy and endothelial cell gene expression profiling.
R.M. Blaese, National Cancer Institute, Bethesda, Maryland: Commentary.

SESSION 6: Preclinical and Clinical Translation
Chairperson: W.D. Figg, National Cancer Institute, Bethesda, Maryland

H.M. Pinedo, VU Medical Center, Amsterdam, The Netherlands: Intraperitoneal comparison of pharmacokinetics following subcutaneous and intravenous administration of endostatin.
R.S. Herbst and M.S. O'Reilly, MD Anderson Cancer Center, Houston, Texas: The MD Anderson Phase I endostatin study.
J. Heymach, Children's Hospital, Boston, Massachusetts: Use of circulating endothelial cells as a surrogate marker for endostatin therapy in patients.
J.P. Eder, Dana-Farber Cancer Institute, Boston, Massachusetts: Clinical trials of endostatin.
SESSION 3: Genetic Targets: Metabolism, Muscle Function and Growth Factors, Oxygen Carrying Capacity, Energy Utilization

Chairperson: G.I. Wadler, New York University School of Medicine, Manhasset, New York

C. Sundberg, Karolinska Institute, Stockholm, Sweden: Muscle physiology.
C. Sundberg, Karolinska Institute, Stockholm, Sweden: Metabolism of exercising muscle.
G. Goldspink, Royal Free & University College Medical School, London, United Kingdom: IGF-1.
B.J. Byrne, University of Florida School of Medicine, Gainesville: EPO.
D.C. Wallace, Emory University School of Medicine, Atlanta, Georgia: Mitochondrial energy production and performance.
J. Glorioso, University of Pittsburgh, Pennsylvania: Metabolic changes: Microarrays.

SESSION 4: Roundtable Discussion
Chairperson: T. Friedmann, University of California, San Diego

H.L. Sweeney, University of Pennsylvania, Philadelphia
B.J. Byrne, University of Florida School of Medicine, Gainesville
D.C. Wallace, Emory University School of Medicine, Atlanta, Georgia
B. Saltin, The Copenhagen Muscle Research Centre, Denmark
G.I. Wadler, New York University School of Medicine, Manhasset

SESSION 5: Open Discussion, WADA Statement, and Communiqué
Chairpersons: A. Ljungqvist, International Amateur Athletic Federation, Enebyberg, Sweden; R. Pound, World Anti-Doping Agency, Montreal, Quebec, Canada; G.I. Wadler, New York University School of Medicine, Manhasset, New York; and T. Friedmann, University of California, San Diego

Legal and Ethical Aspects of Gene-based Enhancement in Sport

Chairperson: R.R. Young, Holme Roberts & Owen LLP, Colorado Springs, Colorado
B.-M. Knoppers, Université de Montreal, Quebec, Canada: Legal, medical perspective.
E.T. Jüngst, Case Western Reserve University, Cleveland, Ohio: Biomedical ethics of enhancement.
A. Schneider, The University of Western Ontario, London, Canada: The ethics of sport.
SESSION 3: RNA Trafficking and Translational Control
Chairperson: D.L. Nelson, Baylor College of Medicine, Houston, Texas

O. Steward, University of California, Irvine: Targeting mRNA to synaptic sites on dendrites.
G.J. Bassell, Albert Einstein College, Bronx, New York: Regulation and function of FMRP and FMR1 mRNA trafficking in developing neurons.
M.W. Heintze, European Molecular Biology Laboratory, Heidelberg, Germany: Translational regulation by mRNA-binding proteins.
J. Richter, University of Massachusetts Medical School, Worcester: CPEB-mediated translational control.
J.R. Fallon, Brown University, Providence, Rhode Island: Regulation of FMR1 mRNA translation in neurons.

Overview and Questions

SESSION 4: FMR in Flies
Chairperson: W.T. Greenough, University of Illinois, Urbana

T.A. Jongens, University of Pennsylvania School of Medicine, Philadelphia: Analysis of behavioral and germ line defects of dfmr1 mutant Drosophila.
A. Costa, Princeton University, New Jersey: dFMR-Orb interactions and mRNA localization/translation.
J. Morales, Baylor College of Medicine, Houston, Texas: DFXR regulates brain morphology and function in the CNS.
H. Matthies, University of Utah, Salt Lake City: Does Drosophila FMRP regulate microtubule dynamics/stability?
K. Moses, Emory University School of Medicine, Atlanta, Georgia: Genetic screen for dominant modifiers of dFMR1p.
J.-L. Mandel, Institut Genetique et de Biologie Moleculaire et Cellulaire, Illkirch, France: FMRP interactors and Drosophila results.

Overview and Questions

SESSION 5: FMR RNA Physiology
Chairperson: R.B. Darnell, The Rockefeller University, New York

K.M. Huber, University of Texas Southwestern Medical Center, Dallas: Role for ERK in mGlur and protein-synthesis-dependent LTD.
M.F. Bear, HHMI, Brown University, Providence, Rhode Island: Fragile X: The L1D connection.
R. Malinow, Cold Spring Harbor Laboratory: AMPA receptor trafficking during synaptic plasticity.
K. Zito, Cold Spring Harbor Laboratory: Identification of genes differentially expressed in wild-type and fmr1 knockout mouse barrel cortex.

Summing Up: Current Issues, Future Plans

R.B. Darnell, The Rockefeller University, New York
D.L. Nelson, Baylor College of Medicine, Houston, Texas
S.T. Warren, HHMI, Emory University School of Medicine, Atlanta, Georgia

Coffee break
Sequence-based Disease Gene Hunts

April 28-May 1

Funded by Cold Spring Harbor Laboratory Corporate Sponsor Program

Arranged by A. Chakravarti, Johns Hopkins University School of Medicine, Baltimore, Maryland

Introduction:
J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory
A. Chakravarti, Johns Hopkins University School of Medicine, Baltimore, Maryland

SESSION 1: Concepts of Complex Disease
Chairperson: A. Chakravarti, Johns Hopkins University School of Medicine, Baltimore, Maryland

X. Estivill, The Hospital for Sick Children, Toronto, Canada: Somatic interstitial duplications of chromosome 15 in anxiety disorders.


SESSION 2: Human Genomic Variation
Chairperson: C.H. Langley, University of California, Davis

J.L. Weber, Marshfield Medical Research Foundation, Wisconsin: Diallelic insertion/deletion polymorphisms.
D. Altshuler, Massachusetts General Hospital, Boston: A large-scale study of human haplotypes in four population samples.
D. Cutler, Johns Hopkins University School of Medicine, Baltimore, Maryland: Human genetic substructure and its implications for disease association studies.

SESSION 3: Human Genome Structure
Chairperson: F.S. Collins, National Human Genome Research Institute, Bethesda, Maryland

J.D. McPherson, Washington University, St. Louis, Missouri: Whole-genome comparative physical maps.
M. Clamp, The Sanger Institute, Cambridge, United Kingdom: Human genome annotation in Ensembl.
F.S. Collins, National Human Genome Research Institute, Bethesda, Maryland: Commentary.

SESSION 4: Genomic Scanning Technology
Chairperson: D. Altshuler, Massachusetts General Hospital, Boston

C.R. Cantor, Sequenom Inc., San Diego, California: Finding disease genes in the healthy population.
M.S. Chee, Illumina, Inc., Cardiff, California: Automated large-scale SNP genotyping on randomly assembled arrays.
M. Zwick, McKusick-Nathans Institute of Genetic Medicine, Baltimore, Maryland: High-throughput genome resequencing using microarrays and the ABACUS software package.
M. Wigler, Cold Spring Harbor Laboratory: Mapping genome deletions using microarray methods.

SESSION 5: Discussion: Present and Future
Chairperson: A Chakravarti, Johns Hopkins University School of Medicine, Baltimore, Maryland

Points for Discussion Arising during Meeting

M. Clamp, E. Dawson

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SESSION 3: Mechanistic Studies In Vitro
Chairpersons: I.B. Weinstein, Columbia University, New York, and Z. Dong, University of Minnesota, Austin

I.B. Weinstein, Columbia University, New York: Molecular mechanisms of growth inhibition by EGCG.
Z. Dong, University of Minnesota, Austin: The effects of tea polyphenols on signal transduction pathways.
Y. Gao, Karolinska Institute, Stockholm, Sweden: Suppression of angiogenesis by green tea.

M. Egeblad, University of California, San Francisco: Green tea as a matrix metalloproteinase inhibitor: Review of the literature.
S. Garbisa, Università degli Studi di Padova, Italy: Green tea inhibition of matrix proteases instrumental to invasion.

SESSION 4: Epidemiological Studies I
Chairpersons: L. Arab, University of North Carolina, Chapel Hill, and Y.-T. Gao, Shanghai Cancer Institute, China.

L. Arab, University of North Carolina at Chapel Hill: Tea and rectal cancer, epidemiologic studies in the U.S. and Russia.
I. Hakim, University of Arizona Health Sciences Center, Tucson: Green tea and oxidative stress among smokers: Results from a randomized clinical trial.
Y.-T. Gao, Shanghai Cancer Institute, China: Epidemiological studies on cancer and green tea drinking in Shanghai, China.
Y. Tsubono, Tohoku University, Sendai: A summary of Japanese epidemiologic studies, published and unpublished.
J.-M. Yuan, University of Southern California: Urinary tea polyphenols in relation to reduced risk of gastric and esophageal cancers: Findings from the Shanghai cohort study.
Z.-F. Zhang, University of California of Los Angeles School of Public Health: Green tea drinking and reduced risk of gastric cancer and chronic gastritis.

SESSION 5: Epidemiological Studies II
Chairperson: C.S. Yang, Rutgers University, Piscataway, New Jersey

C.-C. Hsieh, University of Massachusetts, Worcester: Green tea and cancer: Some thoughts on intervention studies.

SESSION 6: Final Assessment and Future Research

Discussion A: What are the mechanisms of inhibition of carcinogenesis by tea constituents? How do we integrate studies in vivo and in vitro?
Discussion B: Does tea consumption inhibit human carcinogenesis? How can we reconcile the different results in epidemiological studies?
Discussion C: What are the key questions to be answered on tea and cancer? How can we set about answering them?
SESSION 3: Discussion Panels II

PANEL 2: Protein-based Techniques
Chairperson and Discussion Leader: R. Brent, The Molecular Sciences Institute, Inc., Berkeley, California
R. Brent, The Molecular Sciences Institute, Inc., Berkeley, California
R.R. Breaker, Yale University, New Haven, Connecticut
I. Burbulis, The Molecular Sciences Institute, Inc., Berkeley, California
A. Ellington, University of Texas, Austin
M. Sitharam, University of Florida, Gainesville

SESSION 4: Discussion Panels III

PANEL 3: Miscellaneous
Chairperson and Discussion Leader: N.C. Seeman, New York University, New York
N.C. Seeman, New York University, New York
H.R. Garner, University of Texas Southwestern Medical Center, Dallas
E.M. David, The Rockefeller University, New York
B. Mishra, Courant Institute of Mathematical Sciences, New York University, New York
A. Ray, University of Rochester, New York

SESSION 5: Conclusions
Chairperson: B. Mishra, Courant Institute of Mathematical Sciences, New York University, New York

SESSION 6: Panel Summaries and Review

SESSION 7: Key Points for Report and Recommendations
M. Desai, National Science Foundation, Arlington, Virginia
S. Katona, Department of Health and Human Services, Washington, D.C.
J.T. Schwartz, Courant Institute of Mathematical Sciences, New York University, New York
SESSION 3: Cell Cycle/Myc
Chairperson: C.J. Sherr, St. Jude Children's Research Hospital, Memphis, Tennessee

A. Zetterberg, Karolinska Institute, Stockholm, Sweden: Cell growth and checkpoints in G1,
K. Helin, European Institute of Oncology, Milano, Italy: Suppression of the pRb- or p53-mediated G1 checkpoint is required for E2F-induced S-phase entry.
J.M. Sedivy, Brown University, Providence, Rhode Island: What does Myc do: A few new insights into the cell growth versus proliferation conundrum.

SESSION 4: INK4a/ARF
Chairperson: G. Peters, Cancer Research UK, London, United Kingdom

C.J. Sherr, St. Jude Children's Research Hospital, Memphis, Tennessee: Ink4 genes and ARF.
J.A. DeCaprio, Dana-Farber Cancer Institute, Boston, Massachusetts: Genetic interactions between SV40 large T antigen and p53, Ink4a, and Arf.
M. van Lohuizen, The Netherlands Cancer Institute, Amsterdam: Senescence-bypass and transformation screens in primary mouse cells.

SESSION 5: Transformation/Tumorigenesis
Chairperson: J.M. Sedivy, Brown University, Providence, Rhode Island

W.C. Hahn, Dana-Farber Cancer Institute, Boston, Massachusetts: Human cell transformation: Cooperation among telomerase, tumor suppressor proteins, and oncogenes.
C. Counter, Duke University Medical Center, Durham, North Carolina: Distinct requirements for Ras oncogenesis in human versus mouse cells.
M. Frame, Beatson Institute for Cancer Research, Glasgow, United Kingdom: Transformation and cancer behavior controlled by Src kinase.
Hartmut Land, University of Rochester Medical Center, New York: Mechanisms of oncogene cooperation.
SESSION 3: Genetics of Melanoma
Chairperson: J. Sambrook, Peter MacCallum Cancer Research Institute, East Melbourne, Australia

D. Hogg, The University of Toronto, Canada: Using familial melanoma to probe mechanisms of tumor suppression.
J.M. Trent, National Human Genome Research Institute, Bethesda, Maryland: Using microarrays to dissect the genetics of melanoma.

 SESSION 4: Molecular Biology of Melanoma
Chairperson: A.J. Levine, Institute for Advanced Studies, Princeton, New Jersey

Z.A. Ronai, Mount Sinai School of Medicine, New York: The transcriptional switch and melanoma resistance to apoptosis.
M.S. Soengas, University of Michigan Comprehensive Cancer Center, Ann Arbor: Bypassing cell death deficiencies in melanoma.

SESSION 5: Detection and Targeting of Melanoma
Chairperson: D.E. Fisher, Dana-Farber Cancer Institute, Boston, Massachusetts

D. Becker, University of Pittsburgh Cancer Institute, Pennsylvania: Molecular and optical imaging analysis of melanoma and nevi in the context of biological therapy.
I. Haluska, Pacific Northwest Research Institute, Seattle, Washington: Therapeutic tumor vaccination of an MHC class I and II negative mouse melanoma.
S. Ferrone, Roswell Park Cancer Institute, Buffalo, New York: HLA class I antigen abnormalities in melanoma cells: What have we learned?
P.S. Huang, GlaxoSmithKline, King of Prussia, Pennsylvania: Application of the IL-18 cytokine as an antimelanoma therapy.

Walking to lunch at Robertson House
DNA Recombination and Repair

October 20–23

FUNDED BY Cold Spring Harbor Laboratory Corporate Sponsor Program

ARRANGED BY J. Haber, Brandeis University, Waltham, Massachusetts
S. Hawley, Stowers Institute for Medical Research, Kansas City, Missouri

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

SESSION 1

Overviews:
J. Pettrini, Memorial Sloan-Kettering Cancer Center, New York, and P. Sung, University of Texas Health Science Center, San Antonio:

What does the MRX (MRN) complex do? Does it directly act as an exonuclease in vivo or does it control an unknown exonuclease (or endonuclease)? Does it bridge DNA ends or span sister chromatids similar to other SMC proteins? Does it play a role in end-joining other than in budding yeast?

S.C. Kowalczykowski, University of California, Davis:

How does Rad51p assemble on to a filament and what do other recombination proteins do during this process of strand invasion?

SESSION 2

Overviews:
D. Bishop, University of Chicago, Illinois:

What does Dmc1 do that Rad51 doesn’t do? How might Dmc1 and Rad1 act at opposite ends of a DSB? How are the two ends of a DSB coordinated and why doesn’t BIR occur if both ends of a DSB share homology to the donor?

F.W. Stahl, University of Oregon, Eugene, and M. Lichten, National Cancer Institute, NIH, Bethesda, Maryland:

Are there two distinct crossover-generating pathways in meiosis, one using only Rad51 (but also Msh4/5-independent) and one using both Dmc1 and Rad51? How many non-crossover pathways are there and how do they relate to crossover-generating events?

SESSION 3

Overviews:
R. Rothstein, Columbia University, New York, and R. Kanaar, Erasmus University Rotterdam, The Netherlands:

Are there “recombination centers” where many independent repair events occur? How do donor and recipient sequences assemble at these places?

S. Takeda, Kyoto University Medical School, Japan, and M. Jasin, Sloan-Kettering Institute, New York:

What distinguishes vertebrate/mammalian DSB repair from yeast? What do the BRAC proteins do? Why is Rad52 dispensable in worms and flies and not very important in vertebrate cells, even though its overall properties appear to be preserved?

T. Petes, F. Stahl
Global Vaccine Shortage: The Threat to Children and What to Do About It

October 23–25

Funded by Bill & Melinda Gates Foundation, through a grant to Albert B. Sabin Vaccine Institute, Inc.

Arranged by L.K. Gordon, VaxGen, Inc., Brisbane, California
H. Larson, UNICEF, New York
N.E. Tomich, U.S. Medicine Institute, Bethesda, Maryland
L. Miller, Intermedica, Darien, Connecticut

Session 1: Keynote Speeches
C. Bellamy, UNICEF, New York
K. Reilly, Wyeth Global Vaccines, St. Davids, Pennsylvania

Introduction:
J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory
L.K. Gordon, VaxGen, Inc., Brisbane, California
H. Larson, UNICEF, New York

N.E. Tomich, U.S. Medicine Institute, Bethesda, Maryland: Charge to the conference.

Session 2: Return on Investment in the Vaccine Industry

Overview:
D. Braga, Aventis, USA, Swiftwater, Pennsylvania

Discussants:
K. Reilly, Wyeth Global Vaccines, St. Davids, Pennsylvania
S. Jarrett, UNICEF, New York

Round Table Discussions
Reports from Round Tables

Session 3: The Regulatory Process and Vaccines I
Chairperson: L.K. Gordon, VaxGen, Inc., Brisbane, California

Overview:
W. Vandermassen, GlaxoSmithKline Biologicals, Rixensart, Belgium

Discussants:
J.E. Fischer, Committee on Veterans’ Affairs, Washington, D.C.
K. Midthun, FDA, NIH, Rockville, Maryland
J. Milstien, World Health Organization, Geneva, Switzerland

Session 4: The Regulatory Process and Vaccines II
Chairperson: L.K. Gordon, VaxGen, Inc., Brisbane, California

Round Table Discussions
Reports from Round Tables

Session 5: Adequate Vaccine Capacity
Chairperson: L.K. Gordon, VaxGen, Inc., Brisbane, California

Overview:
A. Robbins, Tufts University School of Medicine, Boston, Massachusetts

Discussants:
D. Simpson, Centers for Disease Control & Prevention, Atlanta, Georgia
L. Tan, American Medical Association, Chicago, Illinois

Round Table Discussions
Reports from Round Tables

Session 6: Vaccines as a National Priority

Overview:
S. Bice, Centers for Disease Control & Prevention, Atlanta, Georgia

Discussants:
R. Chalk, National Academy of Sciences, Washington, D.C.
L.Z. Cooper, American Academy of Pediatrics, New York
J.I. Santos, National Immunization Council, Mexico City, Mexico

Round Table Discussions
Reports from Round Tables

Review of Reports: Identifying Areas of Consensus
Next Steps: Need for Task Forces to Follow Up

D. Simpson, J. Heinrich, M. Chafee
SESSION 3: Emotion and Cognition  
Chairperson: L. Wolpert, University College London, United Kingdom  
  A. Bechara, University of Iowa College of Medicine, Iowa City: Is emotion beneficial or disruptive to judgment and decision-making?  
  A. Dickinson, University of Cambridge, United Kingdom: The function of affect: The interface between cognition and motivation.  
  M. Gallagher, Johns Hopkins University, Baltimore, Maryland: Amygdala/orbitofrontal interactions for goal-directed behavior.  
  E.A. Phelps, New York University, New York: The human amygdala and episodic memory or interaction of cognition and emotion.

SESSION 4: Emotion, Mood, and Personality  
Chairperson: L. Wolpert, University College London, United Kingdom  
  D. Evans, University of Bath, United Kingdom: Emotions and physical health: A biological mechanisms for the placebo response.  
  J.J. Gross, Stanford University, California: Emotion regulation.  
  A. Holmes, National Institutes of Health, Bethesda, Maryland: Analysis of emotional behavior in genetically modified mice.  
  A. Ohman, Karolinska Hospital, Stockholm, Sweden: The overlap of emotion activation and attention capture.

SESSION 5: Emotion, Mood, and Society  
Chairperson: D. Bennett, Tufts University, Medford, Massachusetts  
  D. Fessler, University of California at Los Angeles: The evolutionary psychology of human emotions.  
  A. Hopfensitz, CREED, University of Amsterdam, The Netherlands: Emotions in economics.  
  A.R. Hariri, National Institute of Mental Health, Bethesda, Maryland: Genetic variation and the response of the human amygdala.  
  J.S. Winston, University College London, United Kingdom: Brain regions responding to social and emotional information in faces.

SESSION 6: General Discussion and Summary  
Chairpersons: R.J. Dolan, Institute of Neurology, London, United Kingdom, and L. Wolpert, University College London, United Kingdom

A. Dickerson, K. Nader, J. Bachevalier
SESSION 3: Sequence Diversity in Plants I
Chairperson: S. Tingey, DuPont Company, Newark, Delaware

M.D. Purugganan, North Carolina State University, Raleigh: Selection in the Arabidopsis genome.
T. Mitchell-Olds, Max-Planck Institute for Chemical Ecology, Jena, Germany: Functional nucleotide polymorphisms within and between species.
P.B. Cregan, USDA, Agricultural Research Service, Beltsville, Maryland: Nucleotide and haplotype diversity and linkage disequilibrium in cultured and wild soybean.
M. Aquade, Universitat de Barcelona, Spain: Variation in phenylpropanoid genes in cruciferae.

SESSION 4: Sequence Diversity in Plants II
Chairperson: J.A. Rafalski, DuPont Agricultural Enterprise, Newark, Delaware

O. Savolainen, University of Oulu, Finland: Sequence diversity in species at different stages of domestication.
B.S. Gaut, University of California, Irvine: DNA sequence diversity in maize and its wild relatives.
M. Morgante, DuPont Crop Genetics, Newark, Delaware: Sequence conservation in conifers.

SESSION 5: Linking Phenotypes and Sequences
Chairperson: D.T. Tomes, Pioneer Hi-Bred International, Inc., Johnston, Iowa

J.A. Rafalski, DuPont Agricultural Enterprise, Newark, Delaware: Sequence diversity selection and linkage disequilibrium in maize elite germ plasm.
E. Buckler, North Carolina State University, Raleigh: Candidate gene associations across diverse maize germ plasm.
J. Liu, Cornell University, Ithaca, New York: Genetic basis of the evolution of crop plant morphology.
M. Cooper, Pioneer Hi-Bred International Inc., Johnston, Iowa: Modeling breeding strategies for complex traits.
J. Doebley, University of Wisconsin, Madison: What microsatellites tell us about maize and its genome.
SESSION 4: What Have We Learned About Microbial Forensics Over the Past Year? Including What Should Have Been in Place for Anthrax?
Chairperson: S.E. Schutzer, UMDNJ-New Jersey Medical School, Newark
D. Beecher, FBI Academy, Quantico, Virginia: Microbiological sampling at the scene of a covert biological release.
J.W. Ezzell, USAMRIID, Ft. Detrick, Maryland: Sample analysis: Meeting a forensic standard.
P. Kelm, Northern Arizona University, Flagstaff: High-resolution DNA typing for precise identification of bacterial pathogens.
T.D. Read, The Institute for Genomic Research, Rockville, Maryland: Genomics of Bacillus anthracis.

SESSION 5: What Is the State of the Art for “Signatures”? II
Chairperson: P. Kelm, Northern Arizona University, Flagstaff
S. Salberg, The Institute for Genomic Research, Rockville, Maryland, and John J. Dunn, Brookhaven National Laboratory, Upton, New York: Foreign genes: Identification, function, origin, natural, or engineered.
W.D. Wilson, Lawrence Livermore National Laboratory, California, and C.M. Schindler, Lawrence Livermore National Laboratory, California: Nongenomic signatures.
A.D. Steinberg, Mitretek Systems, McLean, Virginia: Host-pathogen interactions.
S.E. Schutzer, UMDNJ-New Jersey Medical School, Newark: Components of the immune response distinguishing perpetrator from victim.
B.J. Luft, SUNY, Stony Brook: Protective measures: Antibiotic half-life vaccines.

SESSION 6: Validating Signatures I

SESSION 7: Validating Signatures II
C. Carrillo, USDA, Agricultural Research Service, NASS, Greenport, New York: Pathogen evolution: Behavior in culture vs. interspecies and intraspecies infections.
J.J. Dunn, Brookhaven National Laboratory, Upton, New York: The unexpected signature.

SESSION 8: General Discussion: What Do These Signature Techniques Mean?
Discussion Leader: R. Breeze, USDA, Agricultural Research Service, Washington, D.C.
What do they not tell us?
How do we interpret them?
What do we need to do to get the degree of attribution we require? And can we reach it?
Can the signatures be forged?
How do we get automated technologies for high throughput?

SESSION 9: Can We Have a Systematic Approach to an Unknown Sample?
Discussion Leader: R. Breeze, USDA, Agricultural Research Service, Washington, D.C.
E.S. Raveche, UMDNJ-New Jersey Medical School, Newark: An algorithmic approach.

SESSION 10: Outline of a U.S. Microbial Forensics System I
Discussion Leader: R. Breeze, USDA, Agricultural Research Service, Washington, D.C.
P.J. Jackson, Los Alamos National Laboratory, New Mexico, and P. Kelm, Northern Arizona University, Flagstaff: Repositories: GenBank.
N.D. Zinder, The Rockefeller University, New York: Personal perspective: Academia and chemical and biological defense.

SESSION 11: Outline of a U.S. Microbial Forensics System II
Chairpersons: B. Budowle, Federal Bureau of Investigation, Washington, D.C., and S.E. Schutzer, UMDNJ-New Jersey Medical School, Newark
R.T. Okinaka, Los Alamos National Laboratory, New Mexico: Sample issues/near neighbors.
S.A. Morse, CDC/NGD/EPK, Atlanta, Georgia: Validation.

QA/QC Proficiency Tests

Research Needs
G. Parker, U.S. Army Medical Research and Material Command, Fort Detrick, Maryland: For each threat class, how can we get the capacity to obtain the information we need and the degree of attribution we require?

Discussion and Recommendations for Action Agencies
Discussion Leaders: B. Budowle, Federal Bureau of Investigation, Washington D.C., and S.E. Schutzer, UMDNJ-New Jersey Medical School, Newark
Oxidases in Inflammation and Cellular Signaling

November 17–20

Funded by Cold Spring Harbor Laboratory Corporate Sponsor Program

Arranged by G.M. Bokoch, The Scripps Research Institute, La Jolla, California
U.G. Knaus, The Scripps Research Institute, La Jolla, California

Introduction:
J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory
G.M. Bokoch, The Scripps Research Institute, La Jolla, California

SESSION 1: Neutrophil NADPH Oxidase (Phox I)
Chairperson: A.R. Cross, The Scripps Research Institute, La Jolla, California

K. Rittinger, National Institute for Medical Research, London, United Kingdom: NADPH oxidase assembly: A structural perspective.
A. Jesaitis, Montana State University, Bozeman: Structural changes induced in human neutrophil cytochrome b by NADPH oxidase activators.
E. Pick, Tel Aviv University Sackler School of Medicine, Israel: Deconstructing the oxidase.
G.M. Bokoch, The Scripps Research Institute, La Jolla, California: Mechanism of NADPH oxidase regulation by Rac GTPase.
M. Dinauer, Indiana University School of Medicine, Indianapolis: Superoxide production by phagocytes: NADPH oxidase and regulation by RhoGTPase Rac2.

SESSION 2: Neutrophil NADPH Oxidase (Phox II)
Chairperson: E. Pick, Tel Aviv University Sackler School of Medicine, Israel

A.R. Cross, The Scripps Research Institute, La Jolla, California: Electron transport in NADPH oxidase.
T.E. DeCoursey, Rush Medical Center, Chicago, Illinois: Interactions between voltage-gated proton channels and NADPH oxidase.
L. Henderson, University of Bristol, United Kingdom: Expression of Nox homologues in gp91phox knockout PLB-95 cells: An explanation for the presence of voltage-gated proton currents.
A.W. Segal, University College London, United Kingdom: The influence of NADPH oxidase induced K+ movement into the phagocytic vacuole on protease activity and microbial killing.
M.T. Quinn, Montana State University, Bozeman: Transcriptional regulation of p67phox gene expression.
H. Sumimoto, Kyushu University, Fukuoka, Japan: The adapter protein p40phox as a positive regulator of the phagocyte NADPH.

J. Jones, T. Leto
Glucocorticoid Regulatory Mechanisms and Pathophysiology

December 8–11

FUNDED BY Cold Spring Harbor Laboratory Corporate Sponsor Program

ARRANGED BY K. Yamamoto, University of California, San Francisco
D.K. Granner, Vanderbilt University School of Medicine, Nashville, Tennessee

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

SESSION 1

Overview: M. Dallman, University of California, San Francisco

Discussants:
S. Davis, Vanderbilt University, Nashville Tennessee
D.B. DeFranco, University of Pittsburgh School of Medicine, Pennsylvania
D.K. Granner, Vanderbilt University School of Medicine, Nashville, Tennessee
G. Schutz, German Cancer Research Center, Heidelberg

What are the key actions and coupling networks for corticosteroids in metabolism, stress, and the HPA axis?

Overview: J. Funder, Prince Henry’s Institute of Medical Research, Clayton, Australia

Discussants
E.R. de Kloet, Gorlaeus Laboratory, Leiden, The Netherlands
D. Pearce, University of California, San Francisco

What are the key actions and coupling networks for corticosteroids in cardiovascular and renal physiology?

SESSION 2

Overview: J.N. Miner, Ligand Pharmaceuticals, San Diego, California

Discussants:
H. Samuels, New York University, New York
A. Shiau, Tularik, Inc., South San Francisco, California
S. Simons, National Institute of Diabetes and Digestive and Kidney Diseases, NIH
H.E. Xu, Van Andel Research Institute, Grand Rapids, Michigan

How can we begin to move toward rational design of selective glucocorticoid agonists?

Overview: M. Garabedian, New York University School of Medicine, New York

Discussants:
J. Funder, Prince Henry’s Institute of Medical Research, Clayton, Australia
P. Herrlich, Institute of Toxicology and Genetics, Karlsruhe, Germany
D. Pearce, University of California, San Francisco
G. Schutz, German Cancer Research Center, Heidelberg

How do receptor modifications, such as phosphorylation, methylation, sumoylation, couple receptor action to other signaling pathways, and what cross-talk circuits are most significant physiologically?
<table>
<thead>
<tr>
<th>Grantor</th>
<th>Program/Principal Investigator</th>
<th>Duration of Grant</th>
<th>2002 Funding</th>
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<td><strong>FEDERAL SUPPORT</strong></td>
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<td>NIH–National Human Genome Research Institute</td>
<td>American Eugenics and the New Biology: Perspectives and Parallels</td>
<td>2002</td>
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<td>National Institute of Justice of the U.S. Department of Justice</td>
<td>Microbial Forensics</td>
<td>2002</td>
<td>30,000 *</td>
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<td>NIH–National Institute of Mental Health and National Institute of Child Health and Human Development (through a grant to the University of Illinois, Urbana)</td>
<td>RNA Metabolism and the Fragile X Syndrome</td>
<td>2002</td>
<td>32,752 *</td>
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<td>National Science Foundation (through a grant to New York University)</td>
<td>Designer Molecules for Biosensor Applications</td>
<td>2002</td>
<td>19,208 *</td>
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<td>U.S. Department of Energy (NNSA, CNBP)</td>
<td>Microbial Forensics</td>
<td>2002</td>
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<td><strong>NONFEDERAL SUPPORT</strong></td>
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<td>Amyotrophic Lateral Disease Association</td>
<td>Neurodegenerative Disease Models: From Pathogenesis to Therapeutics</td>
<td>2002</td>
<td>19,894 *</td>
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<td>Bill and Melinda Gates Foundation (through a grant to Albert B. Sabin Vaccine Institute, Inc.)</td>
<td>Global Vaccine Shortage: The Threat to Children and What to do About It</td>
<td>2002</td>
<td>28,224 *</td>
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<td>Howard Hughes Medical Institute</td>
<td>DNA Interactive Advisory Panel</td>
<td>2002</td>
<td>20,921</td>
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<tr>
<td>Howard Hughes Medical Institute</td>
<td>DNA Interactive Advisory Panel, Second Meeting</td>
<td>2002</td>
<td>21,381</td>
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<td>Huntington’s Disease Society of America</td>
<td>Neurodegenerative Disease Models: From Pathogenesis to Therapeutics</td>
<td>2002</td>
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<td>ICF Ventures</td>
<td>Phage Therapy—Potential and Challenges</td>
<td>2002</td>
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<td>Herbert J. Siegel Fund for Cancer Pharmacogenomics</td>
<td>A Critical Review of Melanoma—Biology and Therapy</td>
<td>2002</td>
<td>34,607</td>
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<td>WADA Health, Medical and Research Committee</td>
<td>Genetic Enhancement of Athletic Performance</td>
<td>2002</td>
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<td>Yamanouchi USA Foundation</td>
<td>Glucocorticoid Regulatory Mechanisms and Pathophysiology</td>
<td>2002</td>
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