BANBURY CENTER DIRECTOR'S REPORT

Banbury Center's tenth year was overshadowed by the tragic death of Steve Prentis in February of 1987. That his program went ahead just as he had planned was due to Terri Grodzicker who became the acting director, and Bea Toliver, the Center's administrative assistant, who took on all responsibility for the day-to-day running of the Center. A total of 14 meetings were held on a wider variety of topics than has been usual in the Banbury program. In addition, we conducted a workshop for science journalists and the second in a series of special meetings arranged in conjunction with Shearson Lehman Brothers. Banbury Center was also host to four advanced lecture courses.

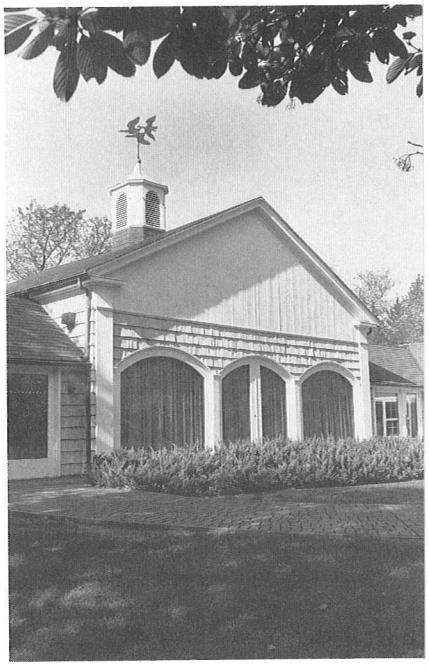
Risk Assessment Program

Three meetings in the risk assessment program were held in 1987, two dealing with the problems of mutations. In the early part of the year, the meeting on **Mammalian Cell Mutagenesis** reviewed the latest data on the molecular mechanisms of mutational events in mammalian cells, and a session of particular importance dealt with recent advances in methods for detecting mutations. It was agreed that there had been interesting developments in understanding the roles of recombination and repair processes in modulating mutational processes in mammalian cells.

The meeting on **Eukaryotic Transposable Elements as Mutagenic Agents** brought together investigators in the areas of eukaryotic retroviruses and transposable elements, cancer biology, DNA damage and repair, and human risk assessment. An area of particular interest concerned the mechanisms of retroviral latency and the factors that might influence this state.

In October, there was a meeting that exemplified the nature of Banbury Center conferences, where a group including academic and industrial scientists and representatives of the regulatory agencies came together to review **New Directions in the Qualitative and Quantitative Aspects of Carcinogen Risk Assessment**. It was clear that risk assessment per se is an extremely complicated and difficult subject, and the Banbury Center will continue to provide a forum for exploring the consequences of the interaction between science and public policy.

Banbury Meeting House



Meetings in the Corporate Sponsor Series

The Corporate Sponsor Program has become the core support of the Banbury Center's activities, providing funds that support meetings concerned with a variety of topics that are of great intrinsic interest and also of importance to those companies that generously contribute to the program.

Two of the meetings dealt with basic techniques in molecular biology. One meeting was concerned with the **Development of the Human Lymphocyte Protein Database**, a system for analyzing and classifying lymphocytes on the basis of their specific proteins detected by two-dimensional polyacrylamide gel electrophoresis. **Antisense RNA** has been promoted as a general method for manipulating gene expression, and a meeting was held in December to review the use of antisense

RNA techniques in a variety of systems. The results have been rather variable, depending on the organism and genes being studied, and this was a particularly timely meeting to examine factors that might account for this variation.

The application of molecular techniques to the analysis of the strategies by which parasites thwart the defenses of their hosts promises to yield tremendous benefits, and a meeting to review advances in the **Molecular Genetics of Parasitic Protozoa** was held at Banbury in November. Another meeting dealing with a topic of great practical importance was that on the **Transformation of Agriculturally Important Crops.** Genetic engineering of plant crops has progressed well beyond the laboratory stage, and much of the meeting was concerned with the practicalities and consequences of developing large-scale field testing. The meeting continued the Banbury theme of dealing with scientific issues of great public interest.

A very popular meeting was that on **Nuclear Oncogenes**, and it was notable for bringing together research workers who perhaps spend less time talking with each other than they should. Among the topics covered were *ras*, *fos*, *myc*, and *myb*, and adenovirus E1A, and although much new information was presented, it is not yet clear what relationship, if any, there is between the mechanisms by which these various oncogenes act.

The question of how extracellular signals are transmitted across the plasma membrane was the subject of a meeting on the **Role of Inositol Lipids in Signaling**. The importance of this mechanism of signal transduction has been recognized increasingly, and as well as dealing with the biochemical pathway involved, the meeting also examined the ways in which increases in free cytoplasmic Ca^{++} concentration come about and how the system is involved in the regulation of cell growth.

Program Meetings

Two other major meetings were held during 1987 at the Banbury Center. In April, a meeting entitled **Therapeutic Peptides and Proteins: Assessing the New Technologies** was organized with support from the James S. McDonnell Foundation and a number of biotechnology companies. The meeting encompassed a wide range of subjects, from reviews of new methods of producing peptides and proteins using recombinant DNA techniques or chemical or enzymatic syntheses, through their characterization and clinical testing, to the ways in which regulatory agencies in the United States and in other countries are dealing with these new developments.

The largest meeting of the year was that on the **Role of the Heat-shock Response in Biology and Disease**, supported by the Samuel Freeman Trust. The meeting considered the function of the so-called heat-shock proteins produced in response to noxious stimuli or disease. It was also one of the most wide-ranging of our meetings, bringing together scientists working on the physiological and behavioral responses of desert animals to heat, with scientists cloning genes and analyzing proteins!

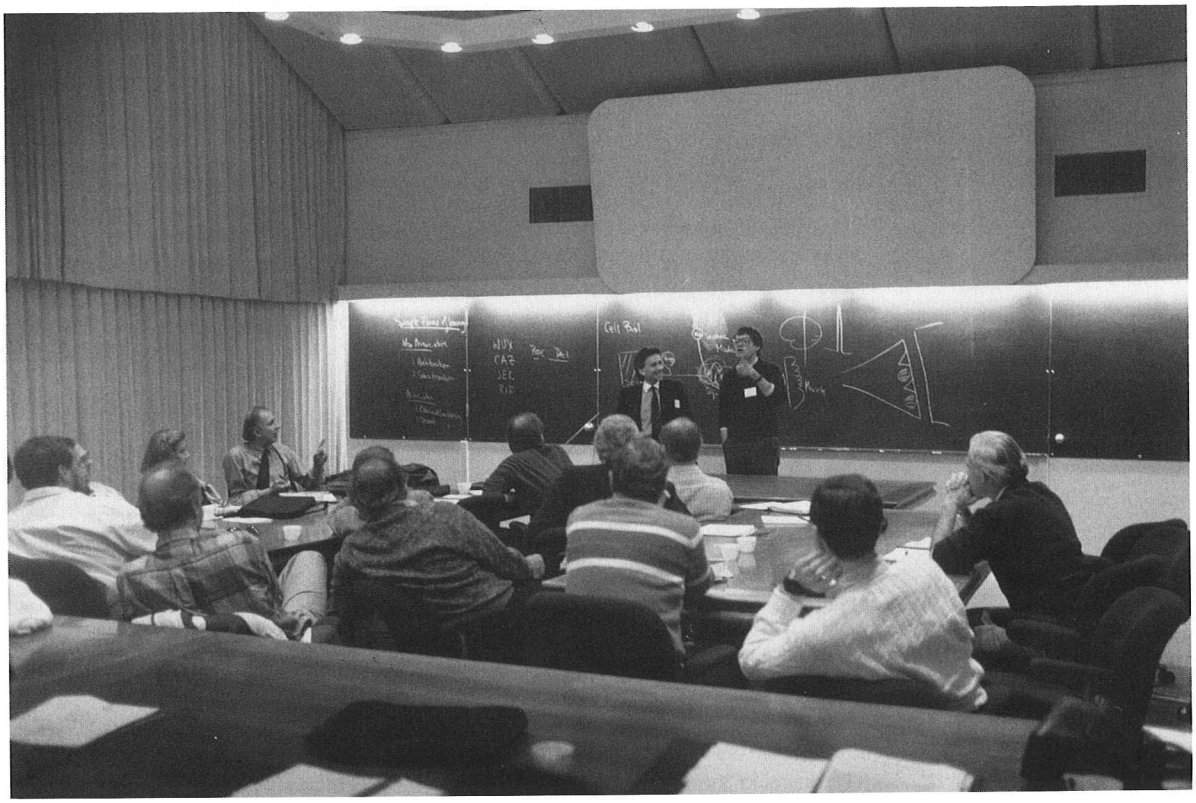
Congressional Staff and Science Journalist Workshops

A growing interest of the Laboratory is the education of the general public in the area of biotechnology, and molecular biology and genetics in particular. In 1980, the Banbury Center, with support from the Alfred P. Sloan Foundation, instituted a

series of small workshops for science journalists and for congressional staffers. The workshops are intended to provide an opportunity for these two groups, who play significant roles in shaping and enacting science policy, to learn in depth about topics of current public concern. In March, a journalists' workshop was held on the **Cellular and Molecular Basis of Normal and Abnormal Development**. An interesting feature of this meeting was that it dealt with development in widely differing animal groups, including *Drosophila*, nematodes, amphibia, and mammals, and with the increasing evidence for the involvement of oncogenes in developmental processes.

Joint Meeting with Shearson Lehman Brothers

Another part of the Banbury Center program for making the scientific basis of biotechnology better understood is a series of meetings for chief executive officers and other senior staff members of companies with an interest in biotechnology. Organized in conjunction with Shearson Lehman Brothers, the meetings are



intended to give the executives who attend an opportunity to learn, at first hand, from scientists who are world authorities in particular topics. The first meeting, **The Genetic Knowledge of Man**, was held in 1986, and the second meeting, entitled **The Human Brain**, was held in October of 1987. The topics covered ranged from the gross anatomy of the brain, through cloning the genes for color vision pigments, to the impact of neurobiology on philosophical problems such as mind-body dualism and free will. An outstanding group of scientists presented talks, and the meeting was a tremendous success.

Robertson House provides housing and dining accommodations at Banbury Center.

Other Meetings

The Banbury Center was also used as a venue to promote the activities of groups concerned with topics of biological or medical importance. A meeting on CCK Antagonists was organized under the auspices of the National Institute of Mental Health. We were pleased to welcome again the Esther A. and Joseph Klingenstein Fund that used the Center to bring together the young neuroscientists supported by the Fund and the Fund's trustees and scientific advisors. The contemplative ambience of Banbury Center meetings was exploited for weekend meetings both by the deans of the Associated Medical Schools of New York and by the Psychiatric Department of Mt. Sinai Hospital Medical School.

Meetings of quite a different kind began in 1987, when the facilities of the Center were used by our neighbors in Lloyd Harbor for a seminar series. Appropriately, the first of these seminars was given by members of the Laboratory: Doug Hanahan spoke on the use of transgenic mice in studying cancer and I spoke on the molecular genetics of Duchenne muscular dystrophy.

Publication of Banbury Center Meetings

Meetings on risk assessment are published as **Banbury Reports**, and as reviews of volumes in the series show, the **Banbury Reports** are established as authoritative and timely studies. In 1987, **Banbury Report 25, Nongenotoxic Mechanisms in Carcinogenesis**, was published. Meetings in the Corporate Sponsor Program held at the Banbury Center are published as **Current Communications in Molecular Biology**. In 1987, four titles were published in this series: **Gene Transfer Vectors for Mammalian Cells**; **Angiogenesis: Mechanisms and Pathobiology**; **Inositol Lipids in Cellular Signaling**; and **Nuclear Oncogenes**. These publications are records of the meetings held here at Banbury, but if the subject of the meeting justifies it, then a book based on the meeting, but dealing with the subject in greater detail, may be considered.

The Future

The Banbury Center is firmly established as a unique contributor to the processes of disseminating and promoting knowledge in the international scientific community. As can be seen from this report, Steve Prentis had begun to diversify the topics covered by Banbury Center meetings, and this is a trend that I intend to continue. The Corporate Sponsor Program and generous long-term funding from sources such as the Alfred P. Sloan Foundation and the James S. McDonnell Foundation have helped support the program, but funding is a continuing concern. I should like to establish series of meetings that would have funds assured over three-year periods, giving us long-term stability for planning exciting and topical meetings. For example, we would hold two meetings each on risk assessment, human genetics, neurobiology, cancer, plant molecular biology, AIDS, and biotechnology each year. These are topics that are scientifically challenging and exciting, and they are areas in which there will be increasing interaction between science and society. The consequences of such interactions must be examined if we are to promote the advancement of scientific knowledge and the well being of society. The Banbury Center will continue to contribute to this process by examining important issues involving the biological sciences and public policy.

Jan Witkowski

Publications

Caskey, C.T., R.E. Gibbs, J.A. Witkowski, and J.F. Hejtmancik. 1988. Human inheritable diseases. *Philos. Trans. R. Soc. Lond. B* (in press).

Hejtmancik, J.F., J.A. Witkowski, S. Gunnel, S. Davis, L. Baumbach, and C.T. Caskey. 1988. Prenatal and carrier detection of Duchenne muscular dystrophy using recombinant DNA technology. In *Nucleic acid probes in diagnosis of human genetic diseases* (ed. A.M. Willey). Alan R. Liss Inc., New York. (In press.)

McCabe, E.R.B., J. Towbin, J. Chamberlain, L. Baumbach, J.A. Witkowski, G.J.B. van Ommen, M. Koenig, L.M. Kunkel, and W.K. Seltzer. cDNA for the Duchenne muscular dystrophy locus demonstrate a previously undetectable deletion in a patient with dystrophic myopathy, glycerol kinase deficiency and congenital adrenal hypoplasia. *Lancet* (Submitted.)

Pizzey, J.A., J.A. Witkowski, and G.E. Jones. 1987. Spreading behaviour of cultured fibroblasts from carriers of Duchenne muscular dystrophy. *J. Cell Sci.* **87:** 163–169.

Witkowski, J.A. 1987. Optimistic analysis—Chemical embryology in Cambridge, 1920–1942. *Med Hist.* **31:** 247–268.

———. 1987. Cell aging in vitro: A historical perspective. *Exp. Gerontol.* **22:** 231–248.

———. 1988. The molecular genetics of Duchenne muscular dystrophy: The beginning of the end? *Trends Genet.* (in press).

———. 1988. RNA splicing—A scientific revolution. *Trends Biochem. Sci.* (in press).

———. 1988. Huxley in the laboratory: Embracing inquisitiveness and widespread curiosity. In *Julian Huxley—Biologist and statesman of science* (ed. A. van Helden). (In press.)

Witkowski, J.A. and C.T. Caskey. 1988. Duchenne muscular dystrophy—DNA diagnosis in practice. In *Current neurology* (ed. S.H. Appel). Medical Year Books, Chicago. (In press.)

MEETINGS

Nuclear Oncogenes

March 3–March 6

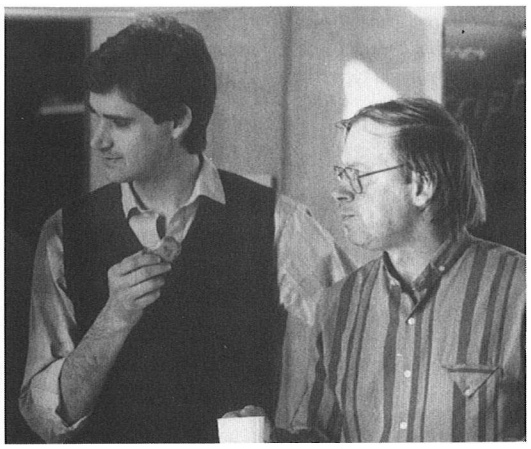
ARRANGED BY

E. Harlow, Cold Spring Harbor Laboratory, New York
F. Alt, Columbia University, New York, New York
E.B. Ziff, New York University Medical Center, New York

SESSION 1

Chairperson: E.B. Ziff, New York University Medical Center, New York

C. Stiles, Dana-Farber Cancer Institute, Boston, Massachusetts: Do inducible nuclear proto-oncogenes play a functional role in growth factor action?
E.B. Ziff, New York University Medical Center, New York: Transcriptional regulation of the c-*fos* gene.
M. Gilman, Cold Spring Harbor Laboratory, New York: Intracellular mediators of c-*fos* induction.
R. Treisman, MRC Laboratory of Molecular Biology, Cambridge, England: Regulation of c-*fos* transcription.
B.H. Cochran, Massachusetts Institute of Technology, Cambridge: Activation of transcription by growth factors.
P. Sassone-Corsi, The Salk Institute, San Diego, California: c-*fos* regulation is mediated by positive and negative cellular factors.
R.G. Roeder, Rockefeller University, New York, New York: Identification and functional analysis of common and gene-specific transcription factors for regulated eukaryotic genes.



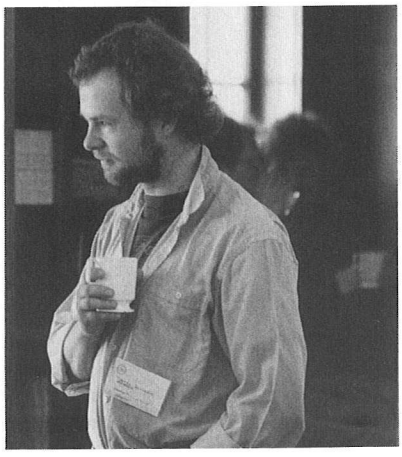
B. Stillman, J. Adams

SESSION 2

Chairperson: A.J. Levine, Princeton University, New Jersey

B. Vennstrom, European Molecular Biology Laboratory, Heidelberg, Federal Republic of Germany: Biochemical and biological functions of the cellular and viral *erbA* oncogenes.
T. Curran, Roche Institute of Molecular Biology, Nutley, New Jersey: Possible role of c-*fos* in signal transduction.
T. Jenuwein, European Molecular Biology Laboratory, Heidelberg, Federal Republic of Germany: Analysis of the molecular and biological function of *fos*.
E. Premkumar Reddy, The Wistar Institute of Anatomy and Biology, Philadelphia, Pennsylvania: Structure, mechanisms of activation, and function of *myb* oncogene.
A.J. Levine, Princeton University, New Jersey: Interaction of p53 with viral and cellular proteins.
D. Beach, Cold Spring Harbor Laboratory, New York: Interaction between products of *cdc2* and *suc1* genes of fission yeast and between the homologs in human cells.

N. Kohl



T. Jenuwein

SESSION 3

Chairperson: E. Harlow, Cold Spring Harbor Laboratory, New York

N.C. Jones, Imperial Cancer Research Fund Laboratories, London, England: Functional and structural characterization of the adenovirus E1A proteins.

E. Moran, Cold Spring Harbor Laboratory, New York: Functional domains in the adenovirus E1A proteins.

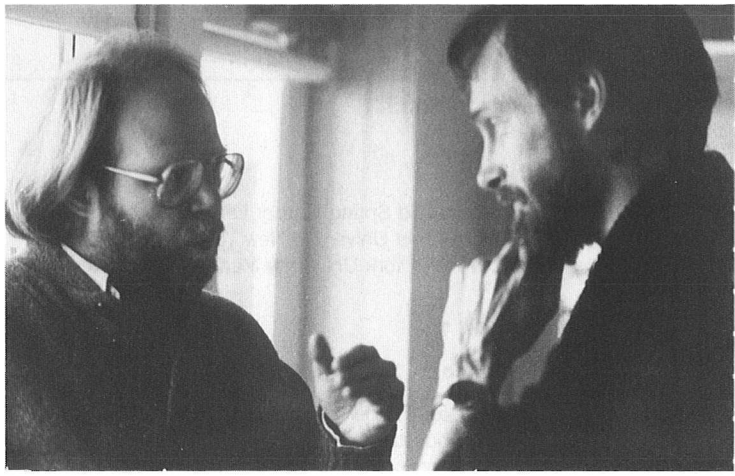
M.R. Green, Harvard University, Cambridge, Massachusetts: A mutational analysis of the adenovirus type 5 E1A protein.

B. Wasylyk, Faculté de Medecine, Strasbourg, France; The *ras* oncogene and a tumor promoter stimulate the polyomavirus enhancer.

E. Harlow, Cold Spring Harbor Laboratory, New York: Regions of the adenovirus E1A proteins required for transformation are binding sites for cellular proteins.

J.R. Nevins, The Rockefeller University, New York, New York: Cellular factors involved in E1A gene control.

J. Brady, National Cancer Institute, Bethesda, Maryland: Transcriptional regulatory sequences in the human T-lymphotropic virus type I long terminal repeat.



E. Harlow, B. Vennstrom

SESSION 4

Chairperson: R. Eisenman, Fred Hutchinson Cancer Research Center, Seattle, Washington

F. Alt, Columbia University, New York, New York: Structure and expression of *myc*-family genes.

R. Dalla-Favera, New York University Medical Center, New York: Mechanisms and biological role of c-*myc* oncogene activation in B-cell tumors.

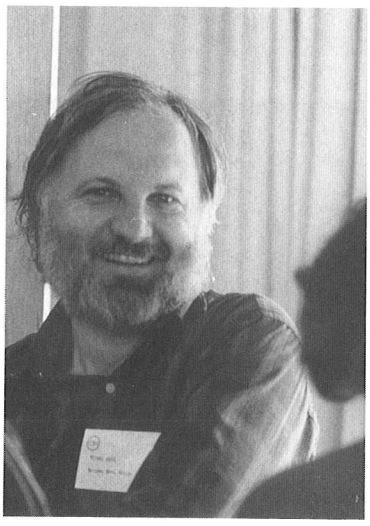
R. Eisenman, Fred Hutchinson Cancer Research Center, Seattle, Washington: Proteins encoded by the c-*myc* oncogene.

W. Lee, University of California, San Francisco: Definition of regions in human c-*myc* involved in transformation and nuclear localization.

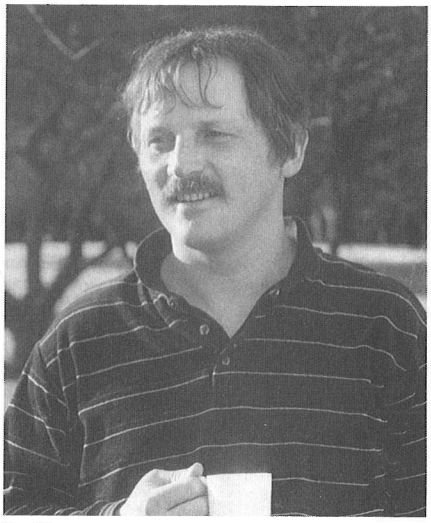
R.A. Watt, Smith Kline & French Laboratories, Swedeland, Pennsylvania: Functional characterization of the c-*myc* protein.

K.B. Marcu, State University of New York, Stony Brook: Regulation and biological properties of the c-*myc* proto-oncogene.

M. Groudine, Fred Hutchinson Cancer Research Center, Seattle, Washington: Control of c-*myc* transcription by blocking elongation.



M. Keuhl



F. Alt

B. Moran

SESSION 5

Chairperson: F. Alt, Columbia University, New York, New York

M. Cole, Princeton University, New Jersey: c-*myc* and the control of cellular gene expression.
U.R. Rapp, N.C.I.-Frederick Cancer Research Facility, Maryland: Role of *myc* in tumor induction, growth factor abrogation, and control of c-*myc* expression.
N. Kohl, Massachusetts Institute of Technology, Cambridge: Mechanisms of oncogene collaboration.
J.M. Adams, Walter & Eliza Hall Institute of Medical Research, Melbourne, Australia: Consequences of enforced *myc* expression within the B-cell lineage of E_{μ}-*myc* transgenic mice.
W.M. Kuehl, National Naval Medical Center, Bethesda, Maryland: Structure, expression, and regulation of murine c-*myb*.
T. Roberts, Dana-Farber Cancer Institute, Boston, Massachusetts: Analysis of the effects of polyoma and SV40 large T antigens on differentiation.
D. Hanahan, Cold Spring Harbor Laboratory, New York: Expression of the murine p53 protein in β cells of insulin–SV40 T antigen transgenic mice.

Journalists' Workshop on the Cellular and Molecular Basis of Normal and Abnormal Development

March 11–March 13

ARRANGED BY

S. Prentis, Cold Spring Harbor Laboratory, New York

SESSION 1

R. Pedersen, University of California, San Francisco: Early development of the mammalian embryo.
I.B. Dawid, National Institutes of Health, Bethesda, Maryland: Development of amphibians.

SESSION 2

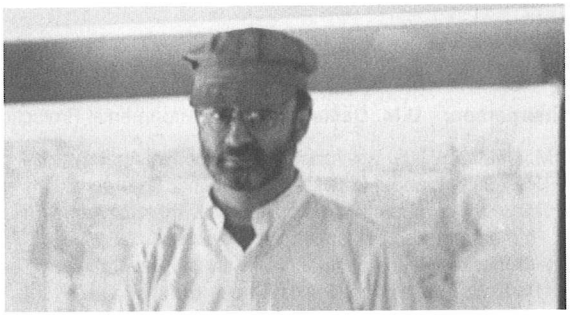
M.P. Scott, University of Colorado at Boulder: The development of *Drosophila* and the role of homeotic genes.
R. Weinberg, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts: Oncogenes.

R. W. Cooke

SESSION 3

J. Kimble, University of Wisconsin, Madison: Nematodes and sex determination.
E.J. Lammer, Massachusetts General Hospital, Boston: Developmental toxicity—The case of accutane.

B. Patrusky



D. Zimmerman

Mammalian Cell Mutagenesis

March 22–March 25

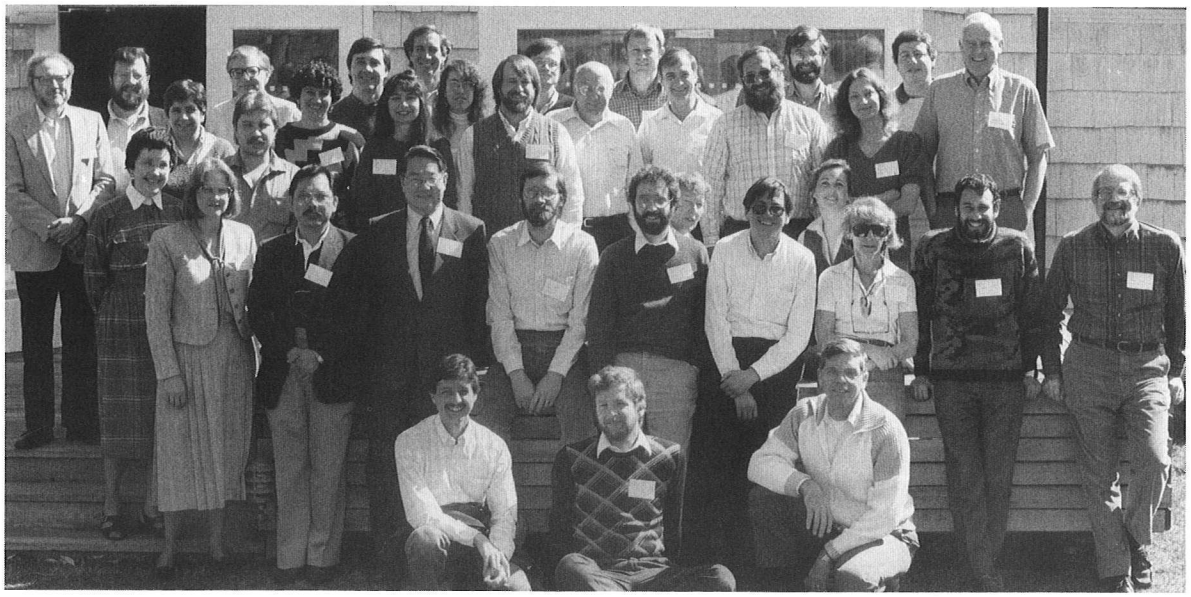
ARRANGED BY

M.M. Moore, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina
F.J. de Serres, Research Triangle Institute, Research Triangle Park, North Carolina
D.M. DeMarini, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina
K.R. Tindall, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina

SESSION 1: A REVIEW OF GENETIC MARKERS FOR THE STUDY OF MUTATION IN MAMMALIAN CELLS

Chairperson: R.J. Albertini, University of Vermont College of Medicine, Burlington

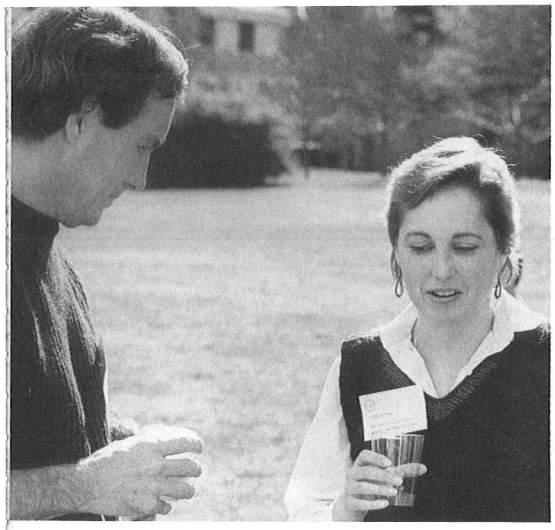
G.M. Adair, University of Texas System Cancer Center, Smithville: The Chinese hamster *aprt* locus.
J.A. Nicklas, University of Vermont, Burlington: Mutation at the human major histocompatibility complex (HLA) as a genotoxicity assay.
D. Clive, Burroughs Wellcome Company, Research Triangle Park, North Carolina: Historical overview of the mouse lymphoma $TK^{+/-}$ mutagenesis assay.
A.W. Hsie, University of Texas Medical Branch, Galveston: The *hyprt* locus as an ideal and cautious choice for studying quantitative mammalian cell mutagenesis.
Panel Discussion (G.M. Adair, R.J. Albertini, D.Clive, A.W. Hsie, J.A. Nicklas)



SESSION 2: DIFFERENTIAL RECOVERY OF MUTANTS AT DIFFERENT LOCI

Chairperson: D.M. DeMarini, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina

D.M. DeMarini, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina: Differential recovery of mutants at hemizygous vs. heterozygous loci in mammmalian cell specific locus assays.
F.J. de Serres, Research Triangle Institute, Research Triangle Park, North Carolina: Specific-locus studies in *Neurospora crassa* predict differential recovery of mutants in mammalian cells.
L.F. Stankowski, Jr., Pharmakon Research International, Inc., Waverly, Pennsylvania: Detection of clastogens vs. point mutagens at the *gpt* or *hgprt* locus.
H.H. Evans, Case Western Reserve University, Cleveland, Ohio: Differential recovery of mutants in cells heterozygous vs. hemizygous for the *tk* locus.
M.M. Moore, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina: Factors that



J. Hozier, K. Dixon

P. O'Neil, R. Jensen, L. Stankowski

affect the recovery of all classes of induced mutations in mammalian cells.

L.B. Russell, Oak Ridge National Laboratory, Tennessee: Genetic and molecular characterization of chromosomal regions surrounding specific loci of the mouse.

Panel Discussion (H.M. Brockman, D.M. DeMarini, F.J. de Serres, H.H. Evans, M.M. Moore, L:B. Russell, L.F. Stankowski, Jr., K.R. Tindall)

SESSION 3: DIFFERENTIAL RECOVERY OF MUTANTS IN VIVO

Chairperson: **M.M. Moore,** U.S. Environmental Protection Agency, Research Triangle Park, North Carolina

R.J. Albertini, University of Vermont College of Medicine, Burlington: Quantitative considerations in in vivo studies.

R.H. Jensen, Lawrence Livermore National Laboratory, California: Use of MN markers in human erythrocytes to quantitate mutation.

Panel Discussion (R.J. Albertini, R.H. Jensen)

SESSION 4: THE MOLECULAR ANALYSIS OF MUTATION

Chairpersons: **F. Hutchinson,** Yale University, New Haven, Connecticut
K.R. Tindall, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina

A. Analysis of Chromosomal Loci

The *aprt* locus

B.W. Glickman, York University, Downsville, Toronto, Ontario, Canada: Studies on mutational specificity in the *aprt* gene of CHO cells.

M. Meuth, Imperial Cancer Research Fund, Herts, England: Molecular basis of genome rearrangements at the hamster *aprt* locus.

Panel Discussion (G.M. Adair, P.J. de Jong, B.W. Glickman, M. Meuth)

Other loci

L.A. Chasin, Columbia University, New York, New York: Mutation at the *dhfr* locus in CHO cells.

E.H.Y. Chu, University of Michigan Medical School, Ann Arbor: Analysis of multilocus mutations in human somatic cells based on protein variants detected by two-dimensional polyacrylamide electrophoresis.

Panel Discussion (L.A. Chasin, E.H.Y. Chu)

SESSION 5: THE MOLECULAR ANALYSIS OF MUTATION (cont'd)

The *tk* and *hgprt* loci

J.C. Hozier, Florida State University, Tallahassee: Cytogenetic and molecular studies of *tk* mutagenesis in mouse L51787 cells.

J.B. Little, Harvard School of Public Health, Boston, Massachusetts: Molecular analyses of *tk* and *hgprt* mutations in human cells.

R.A. Gibbs, Baylor College of Medicine, Houston, Texas: Molecular analysis of HPRT mutations.

J.P. O'Neill, University of Vermont, Burlington: DNA alterations in spontaneous in-vivo- and γ-irradiation-induced in vitro *hgprt* mutants of human T lymphocytes.

Panel Discussion (M. Applegate, R.A. Gibbs, J.C. Hozier, J.B. Little, J.A. Nicklas, J.P. O'Neill)

The *gpt* gene as a chromosomally integrated structure

K.R. Tindall, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Molecular analysis of mutation in the AS 52 cell line.

C.R. Ashman, University of Chicago Medical Center, Illinois: Recovery and analysis of spontaneous and induced mutations from mammalian chromosomal DNA.

Panel Discussion (C.R. Ashman, T.G. Rossman, L.F. Stankowski, Jr., K.R. Tindall)

SESSION 6: THE MOLECULAR ANALYSIS OF MUTATION (cont'd)

B. Shuttle Vectors and SV40
Chairperson: A. Sarasin, Institut de Recherches Scientifiques sur le Cancer, Villejuif, France

M.P. Calos, Stanford University School of Medicine, California: Use of shuttle vectors in human cells.
K. Dixon, National Institute of Child Health and Human Development, Bethesda, Maryland: Analysis of mutation induction in mammalian cells with an SV40-based shuttle vector.
A. Sarasin, Institut de Recherches Scientifiques sur le Cancer, Villejuif, France: Use of SV40 to analyze point mutations induced by UV-light or chemical carcinogens.
Panel Discussion (M.P. Calos, K. Dixon, A. Sarasin)

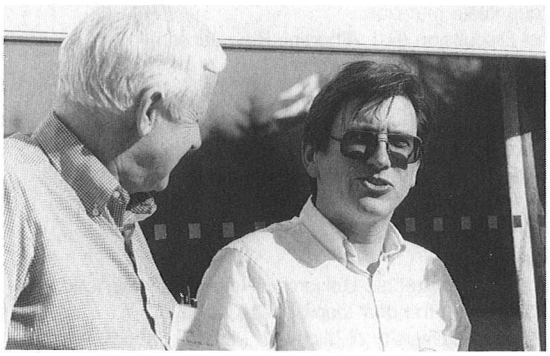
SESSION 7: RECOMBINATION AND REPAIR AS MODULATORS OF MUTATIONAL PROCESSES IN MAMMALIAN CELLS

Chairperson: F.J. de Serres, Research Triangle Institute, Research Triangle Park, North Carolina

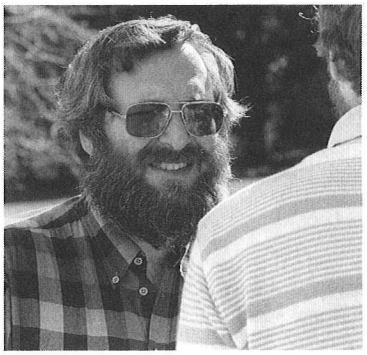
L.H. Thompson, Lawrence Livermore National Laboratory, Livermore, California: Cloning of human DNA repair genes by functional complementation.
V.M. Maher, Michigan State University, East Lansing: Molecular analysis of recombination and gene conversion in carcinogen-treated mouse cells.
Panel Discussion (V.M. Maher, L.H. Thompson)

Summary

E.H.Y. Chu, University of Michigan Medical School, Ann Arbor



J. Little, M. Meuth



B. Glickman

Inositol Lipids in Cellular Signalling

April 5-April 8

ARRANGED BY

R.H. Michell, University of Birmingham, England
J.W. Putney, Jr., National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina

SESSION 1: BIOCHEMISTRY OF INOSITOL LIPIDS AND INOSITOL PHOSPHATES

Chairperson: R.J. Haslam, McMaster University, Hamilton, Ontario, Canada

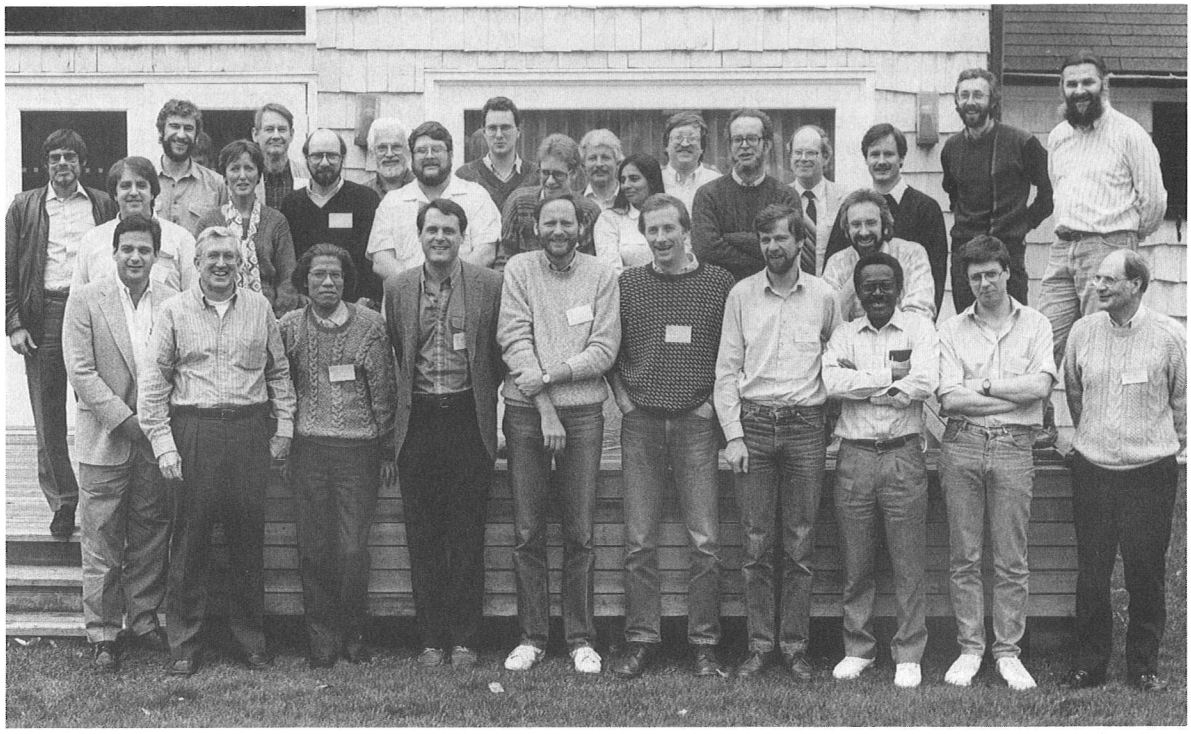
R.H. Michell, University of Birmingham, England: Metabolic pooling of inositol lipids.
C.P. Downes, Smith Kline and French Research Ltd., Welwyn, Herts, England: Specificity of agonist-stimulated

phospholipase C and metabolism of inositol phosphates.

M.C. Gershengorn, Cornell University Medical College, New York, New York: TRH stimulating of inositol lipid metabolism—Evidence for direct hydrolysis of PI as well as PIP_2.

W.R. Sherman, Washington University School of Medicine, St. Louis, Missouri: Evidence that PtdIns and PtdIns-$(4,5)P_2$ respond independently to stimulation.

S.B. Shears, University of Birmingham, England: Hepatic metabolism of inositol polyphosphates.



SESSION 2: RECEPTOR COUPLING TO PHOSPHOLIPASE C

Chairperson: **T.F.J. Martin,** University of Wisconsin, Madison

M. Ui, University of Tokyo, Japan: Differential roles of G_i and G_o in coupling to multiple receptors in brain.

S. Cockcroft, University College London Medical School, England: Regulation of polyphosphoinositide phosphodiesterase by a G-protein.

R.J. Haslam, McMaster University, Hamilton, Ontario, Canada: Activation of platelet phospholipase C by a guanine-nucleotide-binding protein.

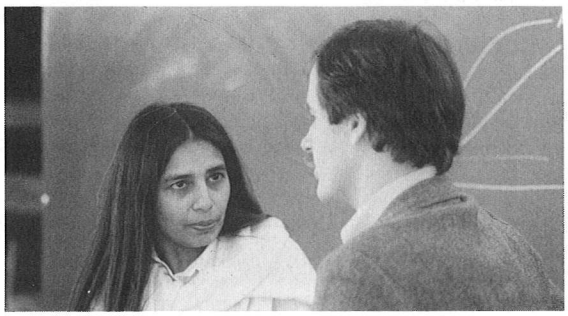
T.K. Harden, University of North Carolina, Chapel Hill: Guanine-nucleotide-binding-protein-mediated regulation of phospholipase C.

C.O. Rock, St. Jude Children's Research Hospital, Memphis, Tennessee: Regulation of phosphatidylinositol 4,5-bisphosphate phospholipase C.

J.N. Fain, Unviersity of Tennessee Center for the Health Sciences, Memphis: Regulation of phosphoinositide-specific phospholipase C in cell-free systems by ligands and guanine nucleotides.

J.C. Cambier, National Jewish Center for Immunology and Respiratory Medicine, Denver, Colorado: Antigen receptor coupling to inositol lipid hydrolysis in isolated B-lymphocyte membranes: Is GTP required?

C. Rock, M. Feinstein



S. Cockcroft, L. Cantley

SESSION 3: ACTION OF INOSITOL LIPID-DERIVED MEDIATORS

Chairperson: I. Schulz, Max-Planck-Institut für Biophysik, Frankfurt, Federal Republic of Germany

T.J. Rink, Smith Kline and French Research Ltd., Welwyn, Herts, England: Receptor-mediated calcium mobilization.

P.H. Cobbold, University of Liverpool, England: The generation of repetitive free-calcium transients in hormone-stimulated cells.

D.L. Gill, University of Maryland School of Medicine, Baltimore: Calcium release mediated by guanine nucleotides and inositol 1,4,5-trisphosphate.

A.P. Thomas, Thomas Jefferson University, Philadelphia, Pennsylvania: GTP-dependent regulation of the $InsP_3$-activated Ca^{++} channel.

M.B. Feinstein, University of Connecticut Health Center, Farmington: Monoclonal antibodies that block response to IP_3.

A.R. Saltiel, Rockefeller University, New York, New York: A role for novel glycosylated phosphoinositides in insulin action.

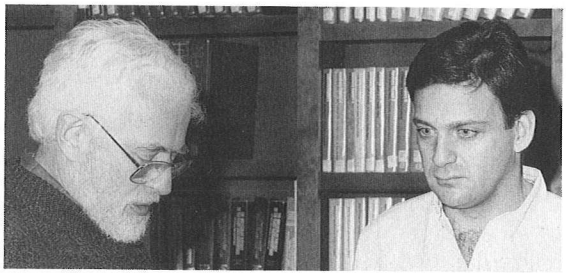
SESSION 4: GROWTH FACTOR AND ONCOGENES

Chairperson: M.D. Houslay, University of Glasgow, Scotland

B.C. Tilly, Netherlands Institute for Developmental Biology, Utrecht, The Netherlands: Signal transduction by growth factors.

L.C. Cantley, Tufts University School of Medicine, Boston, Massachusetts: PI kinases.

I.G. Macara, University of Rochester Medical Center, New York: Down-regulation of protein kinase C by oncogenic transformation.



B. Agranoff, A. Saliel

SESSION 5: PHOSPHOINOSITIDE-LINKED RECEPTORS IN MODEL SYSTEMS

Chairperson: C.P. Downes, Smith Kline and French Research Ltd., Welwyn, Herts, England

J.W. Putney, Jr., National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Receptor regulation of phospholipase C in paratid acinar cells.

I. Schulz, Max-Planck-Institut für Biophysik, Frankfurt, Federal Republic of Germany: Effects of inositol-1,4,5-triphosphate and guanosine nucleotides in stimulus-secretion coupling of exocrine pancreas cells.

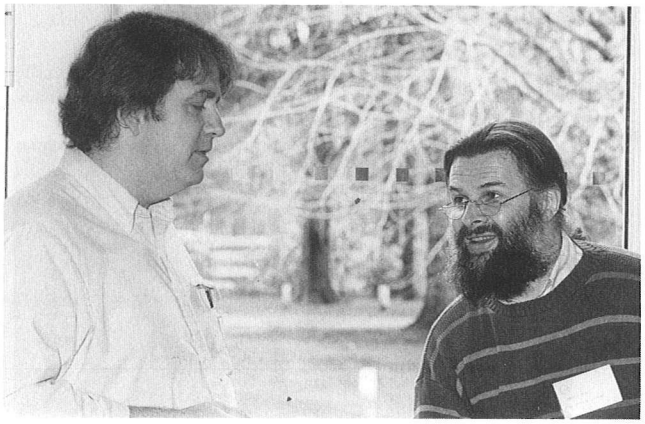
B.W. Agranoff, University of Michigan, Ann Arbor: Inositol lipids in CNS.

S.E. Rittenhouse, University of Vermont College of Medicine, Burlington: Regulation of platelet phospholipase C activation.

T.F.J. Martin, University of Wisconsin, Madison: Mechanisms underlying stimulus-secretion coupling in GH_3 pituitary cells.

A.H. Drummond, University of London, England: Perturbation by lithium ions of inositol phosphate metabolism in GH_3 pituitary cells.

M.D. Houslay, University of Glasgow, Scotland: Desensitization of glucagon-stimulated adenylate cyclase exposes interactions between the signal transduction mechanism that produces cAMP and that stimulating inositol phospholipid metabolism.



J. Putney, R. Mitchell

I. Schultz

Therapeutic Peptides and Proteins: Assessing the New Technologies

April 12–April 15

ARRANGED BY

D.R. Marshak, Cold Spring Harbor Laboratory, New York
A.N. Schechter, National Institutes of Health, Bethesda, Maryland
D.R. Bangham, National Institute for Biological Standards and Control, London, England

SESSION 1: NEW PRODUCTION TECHNOLOGIES

Chairperson: D.R. Marshak, Cold Spring Harbor Laboratory, New York

R.A. Flavell, Biogen Research Corporation, Cambridge, Massachusetts: Recombinant DNA products from prokaryotes.
J. Obijeski, Genentech, Inc., South San Francisco, California: Recombinant DNA products from eukaryotes.
S.B.H. Kent, California Institute of Technology, Pasadena: The chemical synthesis of therapeutic peptides and proteins.
J.T. Johansen, Carlsberg Biotechnology Ltd., Copenhagen, Denmark: Enzymatic synthesis of peptides.

SESSION 2: CHEMICAL AND BIOLOGICAL EVALUATION OF PRODUCTS

Chairperson: D.T. Liu, Food and Drug Administration, Bethesda, Maryland

R.L. Heinrikson, The Upjohn Company, Kalamazoo, Michigan: Purification and chemical characterization of recombinant proteins—The example of human renin.
D.R. Marshak, Cold Spring Harbor Laboratory, New York: Physiochemical characterization of proteins produced by chemical synthesis.
P.W. Robbins, Massachusetts Institute of Technology, Cambridge: Glycosylations.
J.A. Smith, Massachusetts General Hospital, Boston: Acylation and removal of acetylated amino acids.
A.N. Schechter, National Institutes of Health, Bethesda, Maryland: Disulfide bonds.
W. Hancock, Genentech, Inc., South San Francisco, California: Oxidation and degradation.
M. Wigler, Cold Spring Harbor Laboratory, New York: Possible contaminants, DNA-containing oncogenes.
P.L. Storring, National Institute for Biological Standards and Control, London, England: The role of biological methods in evaluating highly purified peptide and protein products.

E. Esber, D. Bangham

SESSION 3: CLINICAL EVALUATION

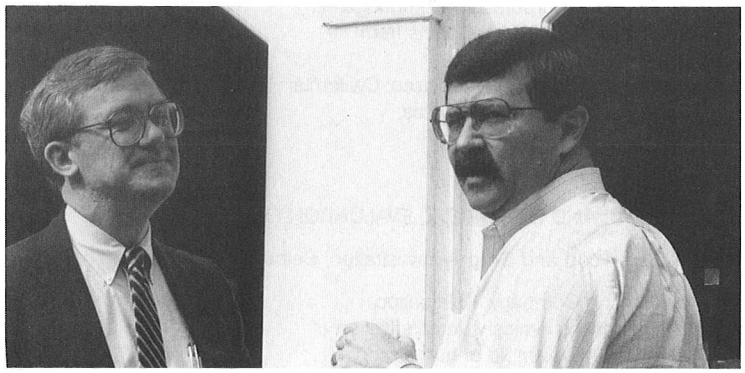
Chairperson: A.N. Schechter, National Institutes of Health, Bethesda, Maryland

J.E. Osborn, University of Michigan: Possible contaminants, viruses.
R.A. Houghten, Scripps Clinic and Research Foundation, La Jolla, California: Immunogenicity.
A.M. Breckenridge, University of Liverpool, England: Clinical toxicity.
B.J. Marafino, Jr., Cetus Corporation, Emeryville, California: The appropriate toxicologic testing of recombinant proteins.
N. Stebbing, I.C.I. Pharmaceutical Division, Cheshire, England: Risk assessment.
D. Hanahan, Cold Spring Harbor Laboratory, New York: Transgenic animal models of disease.
G.W.H. Jay, National Cancer Institute, Bethesda, Maryland: Transgenic animal models for the study of human retroviruses.

D. Liu, L. Sjodin

A. Schecter, D. Marshak

P. Storring



B. Fraser, B. Marafino

Y. Y. Chiu, W. Hancock

D. Vapnek

P. Robbins, R. Blacher

J. Johanson, L. Frycklund

SESSION 4: CASE STUDIES

Chairperson: David L. Aronson, Food and Drug Administration, Bethesda, Maryland

Y. Chiu, Food and Drug Administration, Rockville, Maryland: Scientific review on the safety of the peptide hormones: insulin, hGH, LHRH.

G. Poste, Smith Kline and French Laboratories, Philadelphia, Pennsylvania: Characterization and testing of lymphokines and cytokines.

E. Grossbard, Genentech, Inc., South San Francisco, California: TPA.

D. Vapnek, AMGen, Thousand Oaks, California: Characterization of human erythropoietin produced in CHO cells.

L. Fryklund, KabiVitrum Peptide Hormones AB, Stockholm, Sweden: Recombinant IGF-1 produced in yeast.

SESSION 5: REGULATORY CONCEPTS

Chairperson: D.T. Liu, Food and Drug Administration, Bethesda, Maryland

E.C. Esber, Food and Drug Administration, Bethesda, Maryland: U.S. perspective.

D.R. Bangham, National Institute for Biological Standards and Control, London, England: U.K. perspective.

T. Hayakawa, National Institute of Hygienic Sciences, Tokyo, Japan: Control of the quality of biotechnological therapeutic agents intended for human use in Japan.

L. Sjodin, Socialstyrelsen, Lakemedelsavdelningen, Uppsala, Sweden: Swedish perspective.

J. Hsieh, Development Center for Biotechnology, Taipei, Taiwan, Republic of China: Development of HBsAg vaccine processes in Taiwan, Republic of China.

Eukaryotic Transposable Elements as Mutagenic Agents

April 21–April 24

ARRANGED BY

I.B. Weinstein, Columbia University College of Physicians & Surgeons, New York, New York
M.E. Lambert, Cold Spring Harbor Laboratory, New York
J.F. McDonald, University of Athens, Georgia

SESSION 1: INTRODUCTION: OVERVIEW OF PROKARYOTIC TRANSPOSABLE ELEMENTS

J.A. Shapiro, University of Chicago, Illinois: What transposons do in the bacterial genome.

D. Roberts, Massachusetts Institute of Technology, Cambridge: Communication between a bacterial transposable element and its host.

E.M. Witkin, Rutgers–The State University of New Jersey, Piscataway: Prokaryotic models: SOS functions and mutation.

SESSION 2: MUTATIONAL EFFECTS OF TRANSPOSABLE ELEMENT INSERTIONS–1

M.M. Green, University of California, Davis: Overview.

M. Strobel, N.C.I.-Frederick Cancer Research Facility, Maryland: Molecular genetic analysis of the murine dilute locus.

N. Fedoroff, Carnegie Institution of Washington, Baltimore, Maryland: Regulation of the expression of the maize suppressor-mutator transposable element.

SESSION 3: MUTATIONAL EFFECTS OF TRANSPOSABLE ELEMENT INSERTIONS–2

M.F. Singer, National Institutes of Health, Bethesda, Maryland: Line-1 sequences in primates.

E.L. Kuff, National Cancer Institute, Bethesda, Maryland: Intracisternal A-particle elements as insertional mutagens.

R. Callahan, National Cancer Institute, Bethesda, Maryland: Endogenous human retrovirus-like elements.

SESSION 4: INDUCERS/REGULATORS OF TRANSPOSABLE ELEMENT EXPRESSION AND TRANSPOSITION

Part 1: Host Effects

P.M. Bingham, State University of New York, Stony Brook: Evidence that suppressor-of-white-apricot is a regulatory gene acting at the level of RNA processing.

V.G. Corces, Johns Hopkins University, Baltimore, Maryland: Retroviral elements and suppressor genes in *Drosophila*.

M.C. Wilson, Research Institute of the Scripps Clinic, La Jolla, California: Expression of endogenous replication-defective retroviral elements as regulated by *trans*-acting genes.

SESSION 5: INDUCERS/REGULATORS OF TRANSPOSABLE ELEMENT EXPRESSION

Part 2: Host Effects

F. Winston, Harvard University School of Medicine, Boston, Massachusetts: Host genes required for Ty-mediated gene expression in yeast.

R. Rothstein, Columbia University College of Physicians & Surgeons, New York, New York: Genetic control of recombination between retrotransposon elements in yeast.

J.D. Boeke, Johns Hopkins University, Baltimore, Maryland: Ty element transposition and the yeast genome.

SESSION 6: INDUCERS/REGULATORS OF TRANSPOSABLE ELEMENT EXPRESSION

Part 3: Genetic Mutator Systems

M.G. Kidwell, University of Arizona, Tucson: Regulatory aspects of expression of P-M hybrid dysgenesis in *Drosophila*.

F.H. Sobels, State University of Leiden, The Netherlands: Mutation induction by MR(P) and its modification by various conditions.

D.J. Finnegan, University of Edinburgh, Scotland: Mutation and chromosome rearrangements stimulated by I-R hybrid dysgenesis in *D. melanogaster*.

P Bingham, B. McClintock, J. Shapiro, V. Chandler, M. Green

SESSION 7: INDUCERS/REGULATORS OF TRANSPOSABLE ELEMENT EXPRESSION

Part 4: Genomic Stress and Environmental Effects

J.F. McDonald, University of Georgia, Athens: Stress response and other host-mediated effects on retroviral element expression in *Drosophila*.

C. Paquin, University of Cincinnati, Ohio: Effect of temperature on Ty transposition.

V.L. Chandler, University of Oregon, Eugene: Regulation of mutator transposable elements in maize.

SESSION 8: INDUCERS/REGULATORS OF TRANSPOSABLE ELEMENT EXPRESSION

Part 5: Genomic Stress and Environmental Effects

G.R. Anderson, Roswell Park Memorial Institute, Buffalo, New York: Induction of VL30 and endogenous retroviruses in rat by anoxic stress and cyanide.

M.E. Lambert, Cold Spring Harbor Laboratory, New York: Inducible cellular responses to DNA damage.

H. zur Hausen, Deutsches Krebforschungszentrum, Heidelberg, Federal Republic of Germany: Mutations and DNA amplifications induced by DNA viruses.

SESSION 9: INDUCERS/REGULATORS OF RETROVIRAL ELEMENT EXPRESSION

R. Rothstein, M. Lambert

I.B. Weinstein, Columbia University College of Physicians & Surgeons, New York, New York: Constitutive expression of endogenous retrovirus-related sequences during chemical carcinogenesis.

E. Gateff, Johannes Gutenberg-Universität Mainz, Federal Republic of Germany: c-*src* expression, retrovirus-like particles, and reoviruses in tumors of *D. melanogaster*.

W.C. Greene, Duke University, Durham, North Carolina: HTLV-I, HIV, and human T-cell growth.

SESSION 10: SUMMARY: OVERVIEW

K. Sankaranarayanan, State University of Leiden, The Netherlands: Transposable genetic elements, spontaneous mutations, and the assessment of genetic radiation hazards in man.

J. Cairns, Harvard School of Public Health, Boston, Massachusetts: Implications for cancer.

The Development of the Human Lymphocyte Protein Database

May 10–May 12

ARRANGED BY

R. Franza, Cold Spring Harbor Laboratory, New York
L. Hood, California Institute of Technology, Pasadena

SESSION 1

J.D. Watson, Cold Spring Harbor Laboratory, New York: Introduction.

J. Garrels and R. Franza, Cold Spring Harbor Laboratory, New York: The REF52 cellular protein database: A model for database analysis of mammalian cells.

F.C. Neidhardt, University of Michigan Medical School, Ann Arbor: The *E. coli* protein database.

J.R. Warner, Albert Einstein College of Medicine, Bronx, New York: The yeast protein database.

I. Weissman, Stanford University, California: Systems for the study of lymphoblast differentiation.

SESSION 2

P. Jones, Stanford University, California: Potential of database analysis on studies of T and B lymphoblasts.

C.R. Merril, National Institute of Mental Health, Bethesda, Maryland: Strategies for the use of protein databases to examine disease processes.

E.P. Lester, University of Tennessee, Memphis: GELLAB.

S.M. Hanash, University of Michigan Medical School, Ann Arbor: Application of two-dimensional gels to genetic analyses.

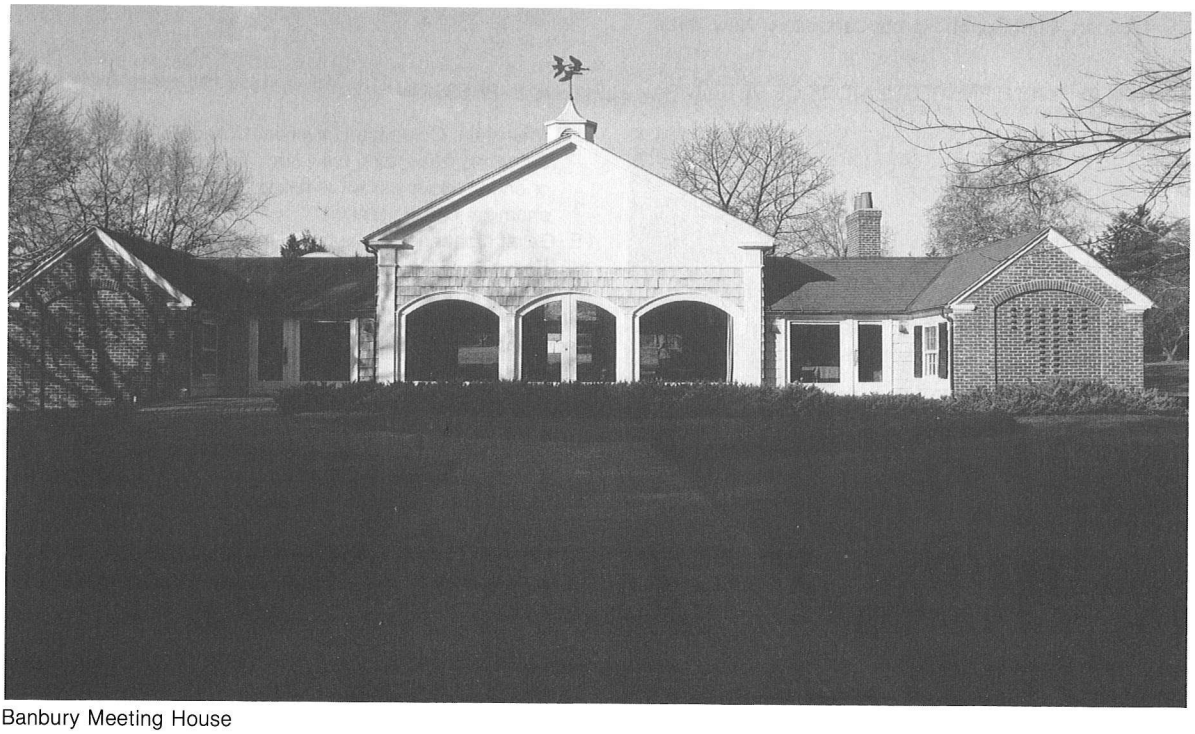
W.R. Parker, Bio Image, Ann Arbor, Michigan: Electrophoretic analysis and data management with machine vision instruments.

N.L. Anderson, Large Scale Biology Corporation, Rockville, Maryland: Studies of gene expression in human lymphoid cells.

I. Lefkovits, Basel Institute for Immunology, Switzerland: Toward an objective classification of the cells in the immune system.

K.E. Willard-Gallo, Catholic University of Louvain, Brussels, Belgium: Two-dimensional gel studies of subpopulations of T lymphoblasts.

S. Blose, Protein Databases, Inc., Huntington Station, New York: The PDQUEST system: Development and construction of protein databases for access and distribution.



Banbury Meeting House

SESSION 3

L. Hood and R. Aebersold, California Institute of Technology, Pasadena: Use of database-directed, two-dimensional gel technology in the purification and biochemical characterization of proteins leading to the isolation of the encoding genes.

L.A. Herzenberg, Stanford University School of Medicine, California: Sorting technologies and gene transfection studies: Impact on the study of lymphoblasts.

R. DeMars, University of Wisconsin, Madison: Two-dimensional gel analysis of MHC-encoded proteins.

D. Goldman, National Institutes of Health, Bethesda, Maryland: Structuring a lymphoblast database to study protein polymorphisms.

R. Franza, Cold Spring Harbor Laboratory, New York: An approach to the study of lymphoblast proteins that interact with control regions in the HIV-LTR.

SESSION 4: DISCUSSION OF POSSIBLE MECHANISMS FOR THE ASSEMBLY OF SPECIFIC LYMPHOCYTE DATABASES

Moderators: **J.D. Watson,** Cold Spring Harbor Laboratory, New York
L. Hood, California Institute of Technology, Pasadena

Discussion of the establishment of a resource to interconnect and distribute such databases.

Discussion of the establishment of a group responsible for the identification of human cellular proteins in specific B- and T-lymphocyte lines for dissemination to all builders and users of lymphocyte databases.

Formation of an internationally recognized coordinating committee to monitor the progress of such an effort.

New Directions in the Qualitative and Quantitative Aspects of Carcinogen Risk Assessment

October 11–October 14

ARRANGED BY

F.D. Hoerger, The Dow Chemical Company, Midland, Michigan
R.W. Hart, National Center for Toxicological Research, Jefferson, Arkansas
J.D. Wilson, Monsanto Company, St. Louis, Missouri

SESSION 1: STRUCTURE ACTIVITY RELATIONSHIP DATA

Chairperson: E.K. Weisburger, National Cancer Institute, Bethesda, Maryland

D. Thakker, National Institutes of Health, Bethesda, Maryland: High-molecular-weight structure.
W. Lijinsky, NCI-Frederick Cancer Research Facility, Maryland: Nitrogen-containing alkylating carcinogens.

Discussants—C.J. Michejda, NCI–Frederick Cancer Research Facility; D.E. Stevenson, Shell Oil Company; H.S. Rosenkranz, Case Western Reserve University; K. Enslein, Health Designs, Inc.

SESSION 2: PHARMACOKINETIC AND METABOLIC ACTIVITY DATA

Chairperson: R.W. Estabrook, University of Texas, Dallas

F.P. Guengerich, Vanderbilt University, Nashville, Tennessee: Interindividual metabolic variation in humans—Mechanisms, methods of assessment, and consequences.
W. Weber, University of Michigan, Ann Arbor: Acetylation pharmacogenetics; acetylator phenotype and assessing susceptibility to aromatic amine carcinogenesis.
W. Farland, U.S. Environmental Protection Agency, Washington, D.C.: Use of pharmacokinetic and metabolism data in quantitative risk assessment.

Discussants: C.C. Travis, Oak Ridge National Laboratory; D.B. Clayson, Health and Welfare Canada; P. Fu, National Center for Toxicological Research; M.C. Poirier, National Cancer Institute

SESSION 3: MOLECULAR BIOLOGICAL DATA

Chairperson: R.B. Setlow, Brookhaven National Laboratory, Upton, New York

B. Singer, University of California, Berkeley: Molecular distortions in DNA.
J.E. Trosko, Michigan State University, East Lansing, Michigan: Nongenotoxic mechanisms in carcinogenesis: Role of inhibited intercellular communication.
W.G. Flamm, U.S. Food and Drug Administration, Washington, D.C.: How molecular data is presently used.

Discussants—M.S. Cohn, U.S. Consumer Product Safety Commission; F.A. Beland, National Center for Toxicological Research; K. Kraemer, National Cancer Institute; R.W. Tennant, National Institute of Environmental Health Sciences

SESSION 4: APPROACHES TOWARD INTEGRATION

Chairperson: E.A. Pfitzer, Hoffmann-La Roche Inc., Nutley, New Jersey

K.S. Crump, Clement Associates, Inc., Ruston, Louisiana: Comparison of estimates from animal and human data.
I.C. Munro, Canadian Centre for Toxicology, Guelph, Ontario, Canada: Qualitative factors in classification.
J.D. Graham, Harvard University, Boston, Massachusetts: Judgmental considerations.
T. Thorslund, Clement Associates, Inc., Washington, D.C.: Framework for a biological model.
D. Krewksi, Environmental Health and Welfare, Vanier, Ontario, Canada: Recent developments in carcinogenic risk assessment.

SESSION 5: IMPLICATIONS FOR POLICY AND RESEARCH

Chairperson: F.D. Hoerger, The Dow Chemical Company, Midland, Michigan

E. Anderson, Clement Associates, Inc., Washington, D.C.: Perspective on risk assessment of carcinogens.
C. St. Hilaire, ILSI Risk Science Institute, Washington, D.C.: Research needs to improve the basis of risk assessment.

Subsession A: Implications for Research Directors
Panel discussion: F.P. Perera, Columbia University School of Public Health; R.W. Hart, National Center for Toxicological Research; R.A. Neal, Chemical Industry Institute of Toxicology

Subsession B: Recommendations for Improving Regulatory Policy for Dealing with Carcinogens
Panel discussion: P.F. Deisler, Jr., University of Houston; A.K. Ahmed, Natural Resources Defense Council

Transformation of Agriculturally Important Crops

October 25–October 28

ARRANGED BY

N.M. Frey, Pioneer Hi-Bred International, Inc., Johnston, Iowa
R.T. Fraley, Monsanto Company, St. Louis, Missouri
J. Schell, Max-Planck-Institut, Koln, Federal Republic of Germany

SESSION 1: PLANT TRANSFORMATION SYSTEMS

J. Schell, Max-Planck-Institut, Koln, Federal Republic of Germany: Plant transformation using *Agrobacterium* and direct DNA uptake methods.
R.B. Horsch, Monsanto Agricultural Company, St. Louis, Missouri: Strategies for practical gene transfer into agriculturally important crops.
A. Weissinger, Pioneer Hi-Bred International, Inc., Johnston, Iowa: Maize transformation via microprojectile bombardment.
D.M. Stalker, Calgene Inc., Davis, California: Development of herbicide resistance in transgenic plants.

SESSION 2: TRANSFORMATION TO IMPROVE TRAITS OF AGRONOMIC IMPORTANCE

C.J. Lamb, The Salk Institute, San Diego, California: Transfer of defense genes.
J.J. Leemans, Plant Genetic Systems N.V., Gent, Belgium: Engineering insect and herbicide resistance in crops.
R.N. Beachy, Washingon University, St. Louis, Missouri: Transformation to produce virus-resistant plants.
C.J. Arntzen, Du Pont Experimental Station, Wilmington, Delaware: Agronomically useful genes for crop plants.
J.B. Mudd, The Plant Cell Research Institute, Inc., Dublin, California: Altering protein and oil quality traits in seeds.
J. Bedbrook, Advanced Genetic Sciences, Oakland, California: Chitinase as a suppressor of fungal diseases.

SESSION 3: FIELD TESTING AND THE DEVELOPMENT OF SEED PRODUCTS

N.M. Frey, Pioneer Hi-Bred International, Inc., Johnston, Iowa: Developing seed products before genetic engineering.

P. Dale, IPSR Cambridge Laboratory, England: Progress toward cereal transformation and field trials of genetically engineered potatoes.

T. Helentjaris, Native Plants, Inc., Salt Lake City, Utah: Identification of agronomically useful genes through RFLP analysis.

S. Rothstein, CIBA-Geigy Corporation, Research Triangle Park, North Carolina: Field testing genetically engineered plants.

R.T. Fraley, Monsanto Company, St. Louis, Missouri: Field testing transgenic plants.

SESSION 4: REGULATORY REQUIREMENTS FOR TESTING AND COMMERCIALLY DEVELOPING GENETICALLY ENGINEERED PLANTS

S. Poe, U.S. Department of Agriculture, Hyattsville, Maryland: U.S.D.A. regulation of genetically engineered plants and microorganisms.

P. Roberts, U.S. Environmental Protection Agency, Washington, D.C.: E.P.A. regulation of genetically engineered plants and microorganisms.

J.H. Maryanski, U.S. Food and Drug Administration, Washington, D.C.: Genetically modified agricultural crops—An F.D.A. perspective.

P.B. Moses, National Research Council, Washington, D.C.: The N.A.S. policy process—Examples in biological control and organism introductions.

SESSION 5: THE ISSUES OF SCIENCE, ECONOMICS AND PRODUCT DEVELOPMENT FOR AGRONOMIC CROPS

R.T. Fraley, Monsanto Company, St. Louis, Missouri—Discussion Leader

V.W. Ruttan, Department of Economics, University of Minnesota, St. Paul

N. Federoff, Carnegie Institution of Washington, Baltimore, Maryland

M.M. Simpson, Congressional Research Service, Washington, D.C.

Recent Advances in the Molecular Genetics of the Parasitic Protozoa

November 3–November 6

ARRANGED BY

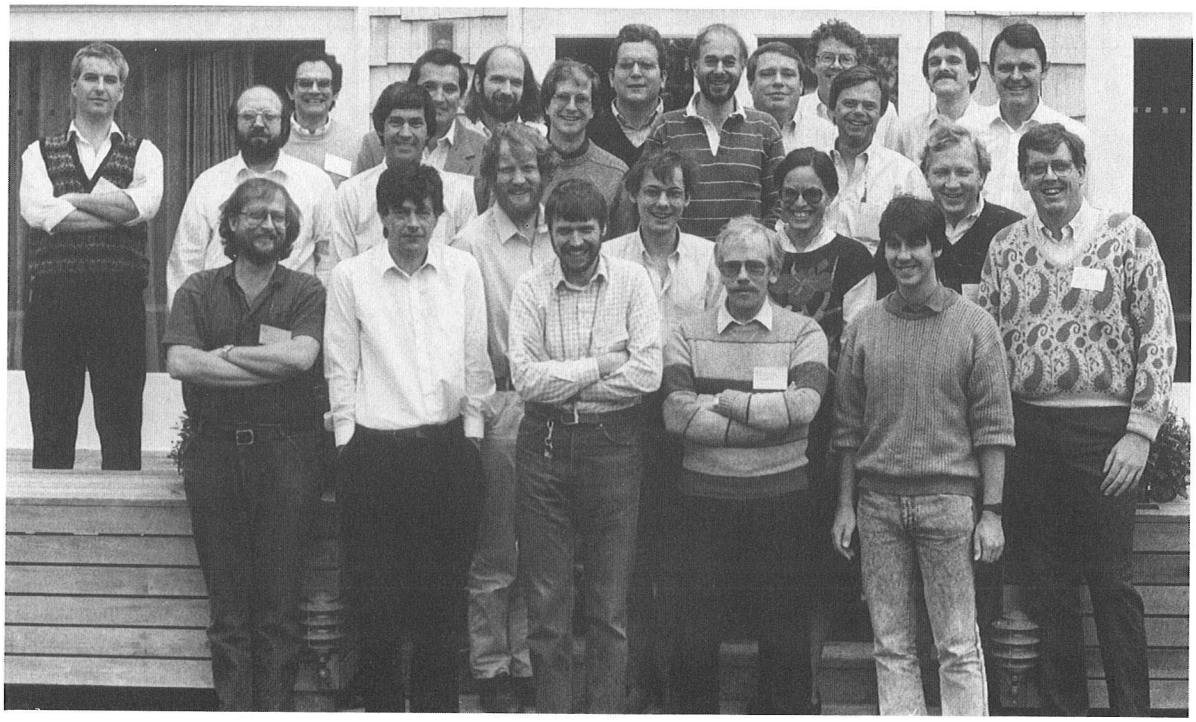
M.J. Turner, Merck Sharp & Dohme Research Laboratories, Rahway, New Jersey
D. Arnot, New York University Medical Center, New York

SESSION 1: MALARIA

V. Enea and D. Arnot, New York University Medical Center, New York: The circumsporozoite gene of *Plasmodia.*
M. Walgren, University of Stockholm, Sweden: Asparagine-rich molecules of *P. falciparum.*
J.V. Ravetch, Sloan-Kettering Institute, New York, New York: Molecular biology of parasite/host interactions.
D. Walliker, University of Edinburgh, Scotland: Genetic recombination in *P. falciparum.*
M. Lockyer, Wellcome Research Laboratories, Beckenham, Kent, England: Variation in *P. falciparum* gene structure.

SESSION 2: MALARIA, THEILERIA AND LEISHMANIA

T.E. Wellems, National Institutes of Health, Bethesda, Maryland: Structural analysis of chromosome-length polymorphisms in *P. falciparum.*
T.F. McCutchan, National Institute of Allergy and Infectious Diseases, Bethesda, Maryland: Stage-specific ribosomes in *Plasmodium.*
A. Tait, Wellcome Unit of Molecular Parisitology, Glasgow, Scotland: Sporozoite and infection-specific antigen genes in *Theileria.*
R. Williams, University of Karlsruhe, Federal Republic of Germany: Autocrine loop immortalization of lymphocytes by *T. parva.*
S.M. Beverley, Harvard Medical School, Boston, Massachusetts: Chromosomal basis of gene amplification in *Leishmania.*
J.M. Kooter, The Netherlands Cancer Institute, Amsterdam: H. Circler in Leishmania.
B. Ullman, Oregon Health Sciences University, Portland: Genetic analysis of purine metabolism in *L. donoyani.*



SESSION 3: TRYPANOSOMES

A. Tait, Wellcome Unit of Molecular Parisitology, Glasgow, Scotland: Genetic exchange in *T. brucei*: Allelic segregation and reassortment.
J.M. Wells, University of Cambridge, England: Genetic analysis of hybrid *T. brucei* clones.
B. Sollner-Webb, Johns Hopkins University School of Medicine, Baltimore, Maryland: Expression of DNA transfected in *T. brucei*.
G.A.M. Cross, Rockefeller University, New York, New York: Mapping the 117 VSG gene-expression site.
L. Van der Ploeg, Columbia University College of Physicians & Surgeons, New York, New York: Role of chromosomal rearrangements in antigenic variation.
J.M. Kooter, The Netherlands Cancer Institute, Amsterdam: Structure and expression of a telomeric VSG gene expression site in *T. brucei*.
E. Pays, Free University of Brussels, Belgium: Transcription in *T. brucei*.

SESSION 4: TRYPANOSOMES

J. Boothroyd, Stanford University School of Medicine, California: *trans*-Splicing and polycistronic transcripts in trypanosomes.
R. Nelson, University of California, San Francisco: RNA processing and trypanosome gene expression.
S.L. Hajduk, University of Alabama, Birmingham: Structure and transcription of k-DNA of trypanosomes.
R. Benne, University of Amsterdam, The Netherlands: Mitrochondrial genes in trypanosomes.
K. Stuart, Seattle Biomedical Research Institute, Washington: Regulation of gene expression in trypanosomes by mRNA editing.
R. Layden, Fred Hutchinson Cancer Research Center, Seattle, Washington: Ubiquitin in trypanosomatids.
J. Manning, University of California at Irvine: Characterization of the 85-kD surface antigen gene of *T. cruzi*.

SESSION 5: GIARDIA AND OTHERS

T.E. Nash, National Institutes of Health, Bethesda, Maryland: Antigenic variation in *Giardia*.
D. Wirth, Harvard School of Public Health, Boston, Massachusetts: Divergence of k-DNA minicircle sequences in *Leishmania mexicana*.
K. Stuart, Seattle Biomedical Research Institute, Washington: Multicopy virus-like nucleic acids in *Leishmania*.

The Role of the Heat-Shock (Stress) Response in Biology and Human Disease

November 9–November 13

ARRANGED BY

R. Morimoto, Northwestern University, Evanston, Illinois
W. Welch, Cold Spring Harbor Laboratory, New York

A. Tissieres, University of Geneva, Switzerland: History and perspective of heat shock.

SESSION 1: THERMOBIOLOGY

Chairperson: M.J. Schlesinger, Washington University, St. Louis, Missouri

A.F. Bennett, University of California, Irvine: Thermal dependence of physiological function.
R.B. Huey, University of Washington, Seattle: Physiological adjustments to fluctuating environments: An ecological perspective.
W.P. Porter, University of Wisconsin, Madison: Multiple low-level stressors affecting growth and reproduction potential in small mammals.
M.J. Kluger, University of Michigan, Ann Arbor: Effects of febrile temperatures on host defense responses.
H.C. Heller, Stanford University, California: Central nervous control of body temperature in health and disease.

SESSION 2: CELLULAR AND MOLECULAR ASPECTS OF THE HEAT–SHOCK RESPONSE. I

Chairperson: C. Georgopoulos, University of Utah School of Medicine, Salt Lake City

S. Lindquist, University of Chicago, Illinois: Expression and function.

J.J. Bonner, Indiana University, Bloomington: Regulation of the heat-shock response.

J. Lis, Cornell University, Ithaca, New York: Engaged RNA polymerase II at the start of uninduced heat-shock genes.

C. Wu, National Cancer Institute, Bethesda, Maryland: Purification and properties of heat-shock activator proteins.

M.L. Pardue, Massachusetts Institute of Technology, Cambridge: 93D-, a different sort of heat-shock locus.

E. Craig, University of Wisconsin, Madison: Genetics and regulation of *hsp70* genes in yeast.

R. Voellmy, University of Miami, Florida: Studies of heat-shock promoters; abnormal protein induction of heat-shock genes.

Evening Informal Session, "Nomenclature of Stress Proteins"

SESSION 3: THERMOTOLERANCE

Chairperson: F. C. Neidhardt, University of Michigan, Ann Arbor

G.M. Hahn, Stanford University, California: RIF-1 and RIF-TR cells: A novel system for investigation of heat resistance, adaptation to heat, and thermotolerance.

E.W. Gerner, University of Arizona, Tucson: Factors affecting thermotolerance expression in mammalian cells.

W.C. Dewey, University of California, San Francisco: Thermotolerance for heat killing and heat radiosensitization of CHO cells.

G.C. Li, University of California, San Francisco: hsp70 as an indicator of thermotolerance: Clinical relevance.

R. Hallberg, Iowa State University, Ames: The eukaryotic homolog of the product of the *E. coli* heat-shock gene, *groEL*, is a mitochondrial protein.

K.N. Prasad, University of Colorado, Denver: Modification of heat sensitivity in neural tumors by cAMP and prostaglandin A_2.

SESSION 4: CELLULAR AND MOLECULAR ASPECTS OF THE HEAT SHOCK RESPONSE. II

Chairperson: S. Lindquist, University of Chicago, Illinois

W. Welch, Cold Spring Harbor Laboratory, New York: Properties and possible functions of mammalian stress proteins.

P. Arrigo, Cold Spring Harbor Laboratory, New York: Characterization of the low-molecular-weight heat-shock proteins.

P.K. Sorger and Hugh R. B. Pelham, M.R.C. Laboratory of Molecular Biology, Cambridge, England: Regulation of the yeast heat-shock transcription factor.

J.R. Subjeck, Roswell Park Memorial Institute, Buffalo, New York: Glucose-regulated response and resistance to chemotherapeutic agents.

M.J. Schlesinger, Washington University, St. Louis, Missouri: Events in heat-shocked chicken fibroblasts.

R. Morimoto, Northwestern University, Evanston, Illinois: Cell cycle and viral oncogene activation of human heat-shock gene expression.

B. Wu, Genetics Institute, Cambridge, Massachusetts: Transcriptional regulation of the human *hsp70* gene.

L. Nover, Institute of Plant Biochemistry, Academy of Sciences of German Democratic Republic: Cytoplasmic heat-shock granules.

Evening Informal Session, "Are Stress Proteins Involved in Thermotolerance?"

SESSION 5: CLINICAL APPLICATIONS OF HYPERTHERMIA

Chairperson: W.C. Dewey, University of California, San Francisco

T. Herman, Dana Farber Cancer Institute, Boston, Massachusetts: Systemic cisplatin (CDDP), local hyperthermia, and radiation for treatment of locally advanced human malignancies.

C. Vernon, Hammersmith Hospital, London, England: Thermal dose.

M.W. Dewhirst, Duke University, Durham, North Carolina: Feasibility of incorporation of spatially varying modifiers of hyperthermic effect in the clinical setting.

J.R. Oleson, Duke University, Durham, North Carolina: Is there evidence of thermal tolerance in clinical hyperthermic results?

J.M.C. Bull, University of Texas, Houston: Systematic hyperthermia combined with chemotherapy.

M. Abe, Kyoto University, Japan: RF capacitive hyperthermia for deep-seated tumors.

SESSION 6: STRESS PROTEIN EXPRESSION DURING DEVELOPMENT

Chairperson: M.L. Pardue, Massachusetts Institute of Technology, Cambridge

N.S. Petersen, University of Wyoming, Laramie: Phenocopy induction and thermotolerance.

L. Hightower, University of Connecticut, Storrs: Expression of mammalian heat-shock genes in early embryos, cultured rat cells, and *E. coli*.

D.J. Wolgemuth, Columbia University College of Physicians & Surgeons, New York, New York: Expression of *hsp70* gene family members in the male mammalian germ cell.

E. Baulieu, INSERM, Bicetre, France: Antisteroid hormones, receptor structure, and heat-shock protein MW 90,000 (hsp90).

D. Pauli and C. H. Tonka, University of Geneva, Switzerland: Structure and expression during development of heat-shock genes 2 and 3 from *Drosophila* locus 67B.

M. Tytell, Wake Forest University, Winston-Salem, North Carolina: Significance of heat-shock protein production in nervous system trauma.

I.R. Brown, University of Toronto, Canada: Analysis of heat-shock gene expression in the mammalian brain using in situ hybridization.

T.S. Nowak, Jr., National Institute of Neurological, Communicative Disorders and Stroke, Bethesda, Maryland: Stress response in brain following transient cerebral ischemia.

D. Young, Hammersmith Hospital, London, England: Stress proteins are antigens in leprosy and tuberculosis.

SESSION 7: CONTROL AND FUNCTION OF STRESS REGULONS

Chairperson: E. Craig, University of Wisconsin, Madison

F.C. Neidhardt, University of Michigan, Ann Arbor: Functions of bacterial heat-shock response.

C. Georgopoulos, University of Utah, Salt Lake City: Role of *E. coli* heat-shock proteins in bacteriophage λ growth.

T. Yura, Kyoto University, Japan: On the roles of σ32 and heat-shock proteins in *E. coli*.

C. Gross, University of Wisconsin, Madison: Regulation of the heat-shock response in *E. coli*.

K. McEntee, University of California, Los Angeles: Stress responsive genes in yeast; transcription regulation of DDR genes by heat shock and DNA damage.

A. Varshavsky, Massachusetts Institute of Technology, Cambridge: Ubiquitin system, selective protein turnover, and the stress response.

A.L. Goldberg, Harvard Medical School, Boston, Massachusetts: Protein breakdown and the heat-shock response.

Antisense RNA

December 1–December 3

ARRANGED BY

D.A. Melton, Harvard University, Cambridge, Massachusetts

SESSION 1: NATURAL EXAMPLES OF ANTISENSE REGULATION

R.W. Simons, University of California, Los Angeles: Antisense RNA control of IS*10* gene expression.

N. Kleckner, Harvard University, Cambridge, Massachusetts: Mechanism of IS*10*'s antisense RNA regulation in vitro.

W.R. McClure, Carnegie Mellon University, Pittsburgh, Pennsylvania: Roles for antisense RNA in bacteriophage gene regulation.

M.M. Susskind, University of Southern California, Los Angeles: Control of the phage P22 antirepressor gene by a small antisense RNA.

M. Inouye, UMDNJ–Robert Wood Johnson Medical School, Piscataway, New Jersey: Antisense RNA as a tool in viral immune systems.

SESSION 2: ANTISENSE OLIGONUCLEOTIDES

J. Walder, University of Iowa, Iowa City: Mechanism of hybrid-arrested translation and applications of antisense oligonucleotides.

A. Weiner, Yale University School of Medicine, New Haven, Connecticut: Inhibition of mRNA splicing by U1 snRNPs with altered specificity.

P.S. Miller, Johns Hopkins University, Baltimore, Maryland: "Antisense" oligonucleotide methylphosphonates.

C. Helene, Museum National d'Histoire Naturelle, INSERM, Paris, France: Regulation of gene expression by oligodeoxynucleotides covalently linked to intercalating agents.

J.J. Toulme, Museum National d'Histoire Naturelle, INSERM, Paris, France: Antisense oligodeoxynucleotides as regulatory agents for parasitic genes.

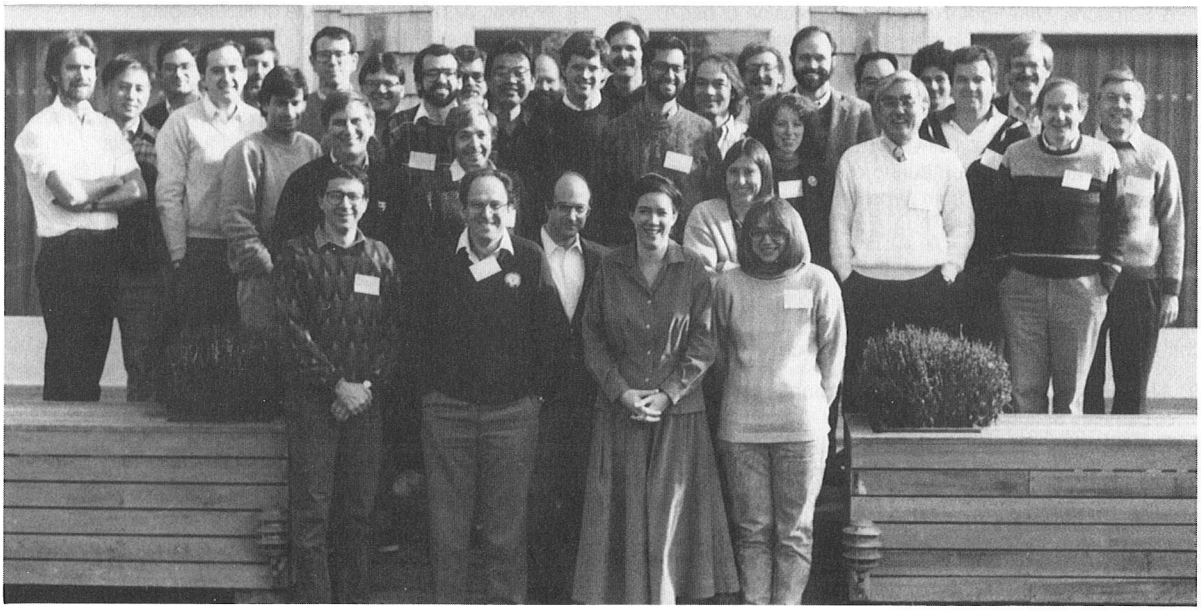
SESSION 3: ANTISENSE RNAs REGULATING GENE FUNCTION IN VIVO. I

R.A. Firtel, University of California, San Diego, La Jolla: Use of antisense to examine gene function in *Dictyostelium*.

S. Cohen, Max-Planck-Institut, Tubingen, Federal Republic of Germany: Phenocopies produced by antisense RNA in *Drosophila* embryos.

S. Lundquist, University of Chicago, Illinois: Use of antisense RNA in investigating the function and regulation of heat-shock proteins.

M. Jacobs-Lorena, Case Western Reserve University, Cleveland, Ohio: Disruption of ribosomal protein gene



expression in *Drosophila* by the conditional expression of an integrated antisense gene.

R.G. Oshima, La Jolla Cancer Research Foundation, California: Suppressive effects of antisense Endo B cytokeratin RNA on embryonal carcinoma differentiation.

SESSION 4: ANTISENSE RNAs REGULATING GENE FUNCTION IN VIVO. II

H. Weintraub, Fred Hutchinson Cancer Research Center, Seattle, Washington: Teflon RNA.

R. Moon, University of Washington School of Medicine, Seattle: Antisense RNA inhibits expression of membrane skeleton protein 4.1 during *Xenopus* development.

S. Strickland, State University of New York at Stony Brook: Antisense injections into the mouse oocyte.

C.T. Caskey, Baylor College of Medicine, Houston, Texas: Antisense inhibition of HPRT in cultured cells and transgenic mice.

R.W. Wagner, The Wistar Institute of Anatomy and Biology, Philadelphia, Pennsylvania: Expression of an RNA duplex unwindase activity in mammalian cells.

SESSION 5: ANTISENSE RNAs REGULATING GENE FUNCTION IN VIVO. III

P.E. Neiman, Fred Hutchinson Cancer Research Center, Seattle, Washington: Antisense RNA effects in avian retroviral vector systems: Viral replication and target gene expression.

M. Kindy, The Salk Institute, San Diego, California: Inhibition of c-*fos* gene expression does not alter the differentiation pattern of PC12 cells.

J.G. Izant, Yale University School of Medicine, New Haven, Connecticut: Enhancement of antisense RNA activity: Antisense RNA to study cell organization.

J. Goodchild, Worcester Foundation for Experimental Biology, Shrewsbury, Massachusetts: Antisense oligodeoxynucleotides as potential inhibitors of HIV replication in tissue culture.

E.W. Holmes, Duke University Medical Center, Durham, North Carolina: Inhibition of translation by antisense RNA complementary to 3′-coding and 3′-noncoding sequences.

D.A. Melton, Harvard University, Cambridge, Massachusetts: Summary.

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Meeting Support			
Department of Energy	Transposable Elements as Mutagenic Agents	1987	5,000*
Environmental Protection Agency	Transposable Elements as Mutagenic Agents	1987	5,000*
	Mammalian Cell Mutagenesis	1987	46,600*
Food and Drug Administration	Approaches to Carcinogenesis	1987	40,000*
National Institutes of Health	Transposable Elements as Mutagenic Agents	1987	10,000*
NONFEDERAL GRANTS			
Meeting Support			
ABI Biotechnology, Inc.	Therapeutic Peptides and Proteins	1987	2,500*
Alfred P. Sloan Foundation	Journalists and Congressional Workshops	1985–1987	162,000
American Industrial Health Council	New Directions in the Qualitative and Quantitative Aspects of Carcinogen Risk Assessment	1987	10,000*
AMGEN	Therapeutic Peptides and Proteins	1987	1,000*
Applied Biosystems	Therapeutic Peptides and Proteins	1987	1,000*
Development Center for Biotechnology, Republic of China	Therapeutic Peptides and Proteins	1987	2,500*
Dow Chemical	New Directions in the Qualitative and Quantitative Aspects of Carcinogen Risk Assessment	1987	5,000*
International Commission for Protection Against Environmental Mutagens and Carcinogens	Transposable Elements as Mutagenic Agents	1987	6,000*
James C. McDonnell Foundation	Conference Support	1985–1987	300,000
Kabivitrum	Therapeutic Peptides and Proteins	1987	2,000*
Molecular Devices Corp.	Therapeutic Peptides and Proteins	1987	1,000*
Samuel Freeman Charitable Trust	Stress Response in Biology and Disease	1987	30,000*

* New grants awarded in 1987

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