

APPENDIX A

Banbury Center 1992

COLD SPRING HARBOR LABORATORY

BANBURY CENTER

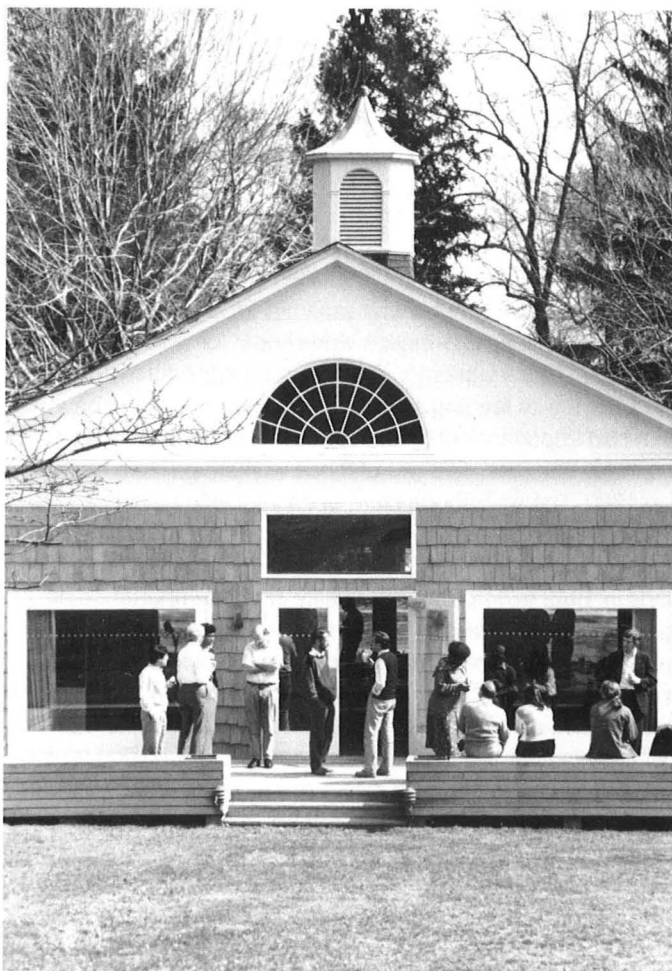
Banbury Center is a 45-acre estate adjoining the waters of Long Island Sound on the north shore of Long Island, barely 40 miles east of downtown Manhattan and located just across the harbor from Cold Spring Harbor Laboratory. The estate was donated to the laboratory in 1976 by Charles Sammis Robertson together with funds for necessary architectural conversions and an endowment to cover upkeep of the grounds and of the original estate structures. With the laboratory's long history and international research reputation and its own renowned ongoing programs of courses and conferences, the magnificent Banbury grounds and buildings presented an ideal site for a complementary program of smaller conferences concentrating on aspects of the biological sciences which also bore significant social implications. Banbury's primary concerns are in areas of molecular biology and genetics, especially as they bear on health, social, and policy issues, and environmental and occupational risk assessment.

Banbury conferences, kept small to maximize uninhibited exchanges between participants, achieve wider dissemination through publications by Cold Spring Harbor Laboratory Press. What was once the estate's original seven-car garage is now administrative offices, a small library, and—at its center—a superb conference room. Equipped with extensive, unobtrusive sound and projection facilities as well as wall-to-wall blackboard space, the room can accommodate as many as fifty participants while remaining equally conducive to either formal presentations or informal give-and-take. The original Robertson neo-Georgian manor house, situated on the final promontory before the grounds descend to the shore of the harbor, now serves as the center for participant accommodations and dining, while the extensive grounds, swimming pool, tennis court, and beach present ample recreational resources. On-site accommodations have been further supplemented by the opening in 1981 of the Sammis Hall guest house—a modern embodiment of the sixteenth century Palladian villas—designed for the Center by the architectural firm of Moore Grover Harper.

Mailing address: Banbury Center, P.O. Box 534, Cold Spring Harbor, New York 11724

BANBURY CENTER DIRECTOR'S REPORT

1992 marked the 15th anniversary of the opening of the Banbury Center, donated to Cold Spring Harbor Laboratory in 1975 by Mr. Charles S. Robertson. What had been the garage for the Robertson estate was converted into the conference room during 1976, and Francis Crick was the inaugural speaker at the dedication that took place on June 14, 1977. Jim Watson, in his annual report for that year, wrote of the new building that "we believe (it) to be the most striking conference center now available to biologists." His confidence has been fully justified by the enthusiasm of researchers for our meetings and the high esteem in which the Banbury program is held by biologists throughout the world. The reputation of the Center has spread beyond academia into the worlds of biotechnology and science policy, sometimes with unexpected consequences. Our 15th year was celebrated with 16 meetings attended by more than 500 visitors.



Banbury Conference Center



Robertson House provides housing and dining accommodations at Banbury Center

Sloan Foundation Workshops

A description of the year's events must begin with a special tribute to the Alfred P. Sloan Foundation for the support it has provided to the Banbury Center program. This support goes back to the very beginning of the program with a grant that, together with a similar grant from the Esther A. and Joseph Klingenstein Fund, provided the bedrock for the first two years of the Center's existence. Victor McElheny, the Center's first director, then persuaded the Sloan Foundation that science education of influential groups was essential for a civilized society and thus began the series of "public information workshops" for science journalists and congressional staff. These workshops provided an opportunity for the participants to spend 2 days with leading scientists and learn in depth about matters of biology that had important public policy implications. This series proved to be a tremendous success, and two of these workshops have been held every year since 1980. The workshops have been very influential because the participants are opinion leaders, ideally placed to transmit what they learned at Banbury.

The two workshops in 1992 exemplified the quality and the importance of these small meetings. **The Commercialization of Biology** meeting dealt with the vexing question of the degree to which research in molecular biology and genetics is being compromised by the rush to exploit the findings. Speakers came from industry, the National Institutes of Health, academia, and the Patents & Trademarks Office. It was at this meeting that the changes in licensing for the polymerase chain reaction were first made public. Later in the spring, there was a meeting on **Occupational and Environmental Health**. Ill health related to the workplace places enormous economic strain on the nation and personal cost on those individuals affected. Improvements in occupational health should be a major target for any administration concerned with reducing health care costs, and this meeting introduced the science journalists and congressional staff to leading workers in the field.

The Alfred P. Sloan Foundation decided, regretfully, that all good things must come to an end. The Foundation will not extend funding for the program beyond 1992, although there will be one more workshop in 1993. So at the same time that we thank the Foundation for its insight and forward thinking in supporting these workshops, we are actively looking for future long-term support for the program.

New Technical Developments in Molecular Biology

The first of the meetings funded by the Corporate Sponsors Program dealt with a topic of great general interest and of special interest to biotechnology and pharmaceutical companies, namely, producing protein molecules with desired characteristics. "Rational" design strategies have not been very effective because the huge number of possible variants of a protein precludes systematic testing of all forms, and our lack of knowledge of the relationships between protein function and structure hinder prediction of which variants to select for testing. The **Phage Display** meeting discussed a new strategy that involves cloning the gene for the protein to be modified into bacteriophage so that the protein is displayed on the surface of the virus. The gene is randomly mutated, and phage bearing a variant protein with characteristics closer to those desired are selected from the enormous population of phage that can be grown in bacteria. The first papers on this technique appeared during 1991, and this was almost certainly the first meeting to discuss these new developments. The meeting set a new Banbury Center record for biotechnology participation with no fewer than 31 of the 45 participants coming from companies!

Molecular Biology

The other meetings funded by the Corporate Sponsor program were all concerned with molecular biology and the ways it has illuminated our understanding of the biology of organisms.

An intriguing biological problem with important medical implications concerns the mechanisms by which some viruses, having infected cells, become dormant. How is it that the DNA of these viruses remains in the infected cells, although the cells continue to function normally? Equally intriguing and important are the mechanisms by which this DNA later becomes activated. **Molecular Mechanisms of Viral Latent Infections** reviewed these topics in relation to the herpesviruses, Epstein-Barr virus, and, of course, human immunodeficiency virus and other RNA viruses.

One way that viral infections might be controlled is by using oligonucleotides that hybridize to and shut down viral genes. This "antisense" strategy has been under intensive development for a number of years, but some new developments led us to hold the meeting **Oligonucleotide Manipulation of Gene Expression: Its Therapeutic Potential**. These developments include the synthesis of oligonucleotides that are more stable when they are in cells and that make more stable combinations with DNA and RNA; further information on the ways in which oligonucleotides enter cells that may in turn lead to improved methods of delivery; and new data on the formation of triple helices.

The meeting **Mechanisms of Neuronal Survival: The Action of Neurotrophic Factors** dealt with the fascinating topic of growth factors that affect nerve cell growth and survival. Sessions discussed not only the factors them-

selves, but also their receptors; regulation of their activities in vivo; their role in development; and the mechanisms by which nerve cells are killed. There is clearly great potential for developing therapies to induce or promote nerve regeneration following nerve damage.

The Wellcome Trust/Cold Spring Harbor Laboratory Meeting

The Wellcome Trust is the principal non-Government source of funding for biomedical research in the United Kingdom and has recently begun to hold meetings. **Constructing Organisms** was a joint meeting of The Wellcome Trust and the Laboratory, the Trust providing funds to cover the costs of the large contingent of European scientists who attended. The meeting brought together researchers working on a veritable zoo of creatures, including fruit flies, mice, zebra fish, nematode worms, sea urchins, toads, leeches, and weeds! Participants examined the extent to which Nature employs common developmental strategies in building organisms. We hope that this may be the first of other joint meetings.

Human Molecular Genetics

In something of a departure compared with recent years, there was but one meeting dealing directly with human genetics. However, the meeting, entitled **DNA Repeats and Human Gene Mutations**, was extremely timely, providing an opportunity to bring together scientists working on three different inherited disorders. The molecular defects in these disorders—Fragile X syndrome (the most common form of inherited mental retardation); myotonic dystrophy (a muscle disorder); and Kennedy's disease (a nerve problem)—had been discovered only in the year preceding the meeting and have been found to be similar. The mutations arise because of the instability of a portion of the DNA in the genes for each disorder. The gene in an affected individual is larger than in an unaffected person, and it continues to enlarge as it is passed on to the next generation. In addition to scientists investigating these disorders, the meeting was attended by scientists who have been working on genome instability in other organisms such as bacteria and yeast in the hope that common themes would be discernible.

Baring Brothers/Cold Spring Harbor Laboratory Meeting

The seventh of these annual meetings, funded initially by Shearson Lehman and more recently by Baring Brothers of London, was held in October 1992. These meetings comprise what has become one of our longest-lived series, so it was appropriate that the 1992 meeting was on **Aging**. The range of topics covered was broad, from the social and economic consequences of our aging population, through basic mechanisms of aging, to Alzheimer's disease. Once again, a group of world-class scientists discussed their latest research, and it was especially pleasing to have Carol Greider present her research on telomere shortening in aging cells. The executives were leaders in the worlds of biotechnology business and investment, and it is clear that this meeting has become a prestigious event.

Databases for Forensic DNA Fingerprinting

We held a meeting at Banbury Center in 1988 on DNA and Forensic Science that examined the new techniques of DNA "fingerprinting" that were just then being taken up in the United States. Although many of the issues raised at that meeting are resolved only partially, implementation of DNA typing has proceeded apace. One problem of tremendous practical consequence concerns the development of databases for storing DNA-typing information, in particular allowing for future technical developments and ensuring the security of such databases. Agencies in New York State are proceeding cautiously and carefully, and this meeting **DNA Forensic Fingerprinting** was held to explore the requirements of these agencies. In addition, representatives of the U.S. Federal Bureau of Investigation and the law enforcement agencies of Florida, Minnesota, and Virginia described their systems. The meeting ended with a discussion of a pilot project to develop a database for New York State.

Human Genome and Genetic Analysis Workshops

Banbury Center and the DNA Learning Center held the second and third in the current series of these workshops sponsored by the Department of Energy in 1992. The format followed that established with the first workshop, namely, lectures on the basics of genetics, talks by invited speakers at the Banbury Center, and practical laboratories at the DNA Learning Center. The presentations by the invited speakers were uniformly excellent and the participants welcomed the opportunity to spend time informally with scientists, genetic counselors, and bioethicists, subjecting them to merciless questioning. An example of the topicality of these workshops has been the presentation of talks on gene therapy by Dr. Kenneth Culver. The first gene therapy treatments were begun in September 1990 on children with a disorder called adenosine deaminase deficiency. We were delighted to welcome one of these children and her family to the workshop in February.

Science Policy Meetings

Banbury Center's role as a meeting place to discuss science policy began some 5 years ago with an influential meeting on scientific misconduct. This year, two fascinating meetings dealt with issues that affect the financing of scientific research. The first meeting, with the rather prosaic title **Indirect Costs and the Independent Research Institute**, was anything but dull. Indirect costs are those expenses relating to the operating costs of an institution that are charged to a grant, in addition to the direct costs of doing the research. Indirect costs can be substantial, and the ire of the Oversight and Investigations Subcommittee of the House Committee on Energy and Commerce was aroused when it appeared that some universities were charging inappropriate items to indirect costs. As a consequence, indirect cost rates for universities came under close scrutiny and revised rates are still being negotiated. Independent research institutions like Cold Spring Harbor Laboratory are governed by a separate set of rules, but it seems clear that these rules are also likely to be revised with potentially catastrophic financial consequences for the independent research institutes. So we decided to hold this meeting to review the current state of indirect cost

charges and to assess what changes were in store and what their consequences might be.

The second policy meeting discussed a topic of immense importance, namely, research in the neurosciences, including basic research in neurobiology and neurology. President Bush issued a proclamation declaring the 1990s the Decade of the Brain. However, relatively little seems to have come from this initiative and there seems to be an absence of leadership and coordination in exploiting this proclamation. The Charles A. Dana Foundation is developing a strong interest in medical neuroscience, and the Foundation provided funding for a meeting entitled **Funding for the Decade of the Brain**. The meeting brought together the leading players from the National Institutes of Health, the various Foundations, concerned with neuroscience, and some of the leading neuroscientists to determine what could be done. Many such meetings end on a high note, but their impact dissipates once the participants have dispersed; there is every reason to believe that this will not be the fate of this meeting. With the Dana Foundation playing the role of midwife, the meeting will give birth to a movement that will make the first decade of the 21st century (if not the 1990s) the Decade of the Brain.

Charles A. Dana Foundation and Manic-Depressive Illness

An event of great significance for the Laboratory and for the Banbury Center was the award of a grant from the Charles A. Dana Foundation for a program to promote research on manic-depressive illness. This program encompasses work at the Johns Hopkins Medical School, Stanford University Medical School, and Cold Spring Harbor Laboratory. Our part of the program, to be based at Banbury, will involve establishing a database that includes information on all aspects of manic-depressive illness and can be accessed by all research workers; this will be developed in collaboration with Tom Marr's group. In addition, we will develop a meetings and courses program as well as a public information program. This work will be a natural extension of Banbury's work on human genetics and science education. We expect that a program director will be appointed in the spring of 1993 and that the program will begin in earnest during the summer.

Other Meetings

As in previous years, we have made Banbury Center available to other groups. The Lloyd Harbor Seminar Series provides an opportunity to learn something of what goes on in the institutions that have their homes in Lloyd Harbor Village, as well as providing a venue to hear the interesting experiences of our neighbors. The Boards of a number of local community groups held their annual meetings here, including the Lloyd Harbor Historical Society, the Lloyd Harbor Conservation Board Society, and Huntington Hospital. In addition, the Cold Spring Harbor School District held a meeting here and the faculty of West Side school came for a pre-school conference.

Funding

The Corporate Sponsors Program continues to be the foundation on which the Banbury Center meetings program is built; six of our meetings in 1992 were

funded by this Program: **Phage Display: Engineering and Selecting Proteins; Molecular Mechanisms of Viral Latent Infections; Oligonucleotide Manipulation of Gene Expression: Its Therapeutic Potential; Control of HIV Gene Expression; Superantigens and Antigenic Presentation; and Mechanisms of Neuronal Survival: The Action of Neurotrophic Factors.** In addition, a number of other companies contributed to meetings during the year. For example, Repligen Corporation, Hoffmann-La Roche, and Merck Research Laboratories contributed to the **Control of HIV Gene Expression** meeting. Repligen Corporation together with Abbott Laboratories contributed to the **Constructing Organisms** meeting. However, private foundations continue to be major supporters of our program. I have already discussed the extraordinary support that the Alfred P. Sloan Foundation has provided during the past 14 years. The importance of such long-term support to an institution such as the Banbury Center cannot be overemphasized.

We continue to search for a replacement. There was not time in 1992 to hold a meeting funded by the William Stamps Farish Fund, but the first meeting of 1993 will be on the **Polygenic Basis of Cancer**. Here again, the 3-year support of this foundation helps provide stability for our program. The Wellcome Trust joined with us in holding the **Constructing Organisms** meeting, and the Charles A. Dana Foundation supported what we hope and expect will turn out to be a historic meeting: **Funding for the Decade of the Brain.**

Acknowledgments

1992 was an exceptionally busy year for the Center, especially during the fall when we had ten meetings and were also planning and organizing the spring 1993 meetings. Bea Toliver and Ellie Sidorenko in the Banbury Center office dealt with the huge influx of participants and coped with the flood of queries, phone calls, and faxes that accompanies every meeting. Katya Davey, hostess at Robertson House, looked after the participants with her customary panache.

Looking Forward to 1993

To begin by looking back, 1992 marked the end of my fifth year at the Banbury Center, and in that period, we have held 75 meetings with some 2500 participants. One of the great pleasures and virtues of the Banbury Center is that the topics of the meetings range so widely and that the participants are equally varied in their interests and backgrounds. Meetings and participants are unified in their commitment to excellence and all of these factors make Banbury Center a unique facility. As usual, the 1993 program is still being developed at this time, but it will provide the same variety of interests and live up to those same standards, with meetings on cancer, gene therapy, neurobiology, cell death, Lyme disease, and science policy. We will begin a new relationship with Helix Partners, which will fund meetings on the science underlying important biotechnological advances, and there will be the new developments on manic-depressive illness just described. One final acknowledgment is necessary. The work of the Banbury Center would not be possible without the support of Jim Watson and the entire Laboratory. My thanks, and those of everyone who comes to Banbury Center, go to all who work on the other side of the Harbor.

Jan A. Witkowski

MEETINGS

Congressional/Science Journalists Workshop on the Commercialization of Biology

January 24–January 26

FUNDED BY

Alfred P. Sloan Foundation

ARRANGED BY

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York

SESSION 1

C. van Horn, U.S. Patent and Trademarks Office, Arlington, Virginia: Mechanics of obtaining a patent.

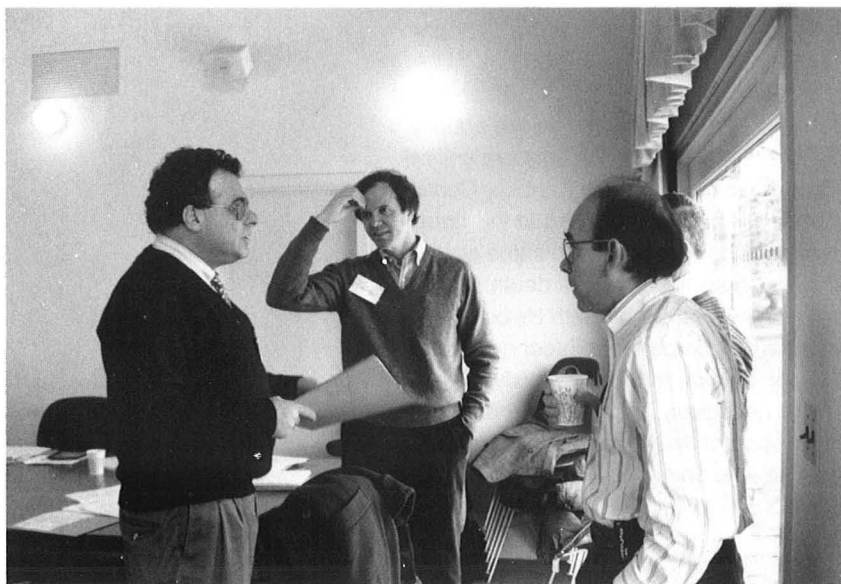
R. Merges, Boston University Law School, Massachusetts: Comparative studies of patenting in biology and other sciences.

J. Barton, Stanford University Law School, California: Special issues in biotechnology patenting.

G. Rathmann, ICOS, Bothell, Washington: Intellectual property and the development of biotechnology.

SESSION 2

M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory: Isolation of DNA.



D. Botstein, R. Merges, R. Charrow

SESSION 3

- D. Botstein, Department of Genetics, Stanford University School of Medicine, California: Materials and data sharing between scientists: The effects of commercialization.
- R. Adler, Office of Technology Transfer, National Institutes of Health, Bethesda, Maryland: NIH's responsibilities and role in developing scientific discoveries.
- A.L. Beaudet, Howard Hughes Medical Institute, Baylor College of Medicine, Houston, Texas: Impact of commercial considerations on the use of DNA-based diagnosis of genetic diseases.

SESSION 4

- L.L. Nelsen, Technology Licensing Office, Massachusetts Institute of Technology, Cambridge: Why and how do academic institutions exploit the intellectual property of their scientists?
- H. Edgar, Columbia University School of Law, New York, New York: Conflicts of interest in the exploitation of intellectual property.
- R.P. Charrow, Crowell & Moring, Washington, D.C.: Summary of issues.



K. Hudson

Phage Display

April 4–April 7

FUNDED BY

Cold Spring Harbor Laboratory Corporate Sponsor Program

ARRANGED BY

G. Smith, University of Missouri, Columbia

M. Zoller, Genentech, Inc., South San Francisco, California

SESSION 1

P. Model, The Rockefeller University, New York, New York: Filamentous phage assembly.

G. Smith, University of Missouri, Columbia: Filamentous fusion and phage.

SESSION 2: Peptides on Phage

W.J. Dower, Affymax Research Institute, Palo Alto, California: Small peptides that mimic conformation-dependent epitopes: Isolation from phage display libraries.

G. Cesareni, University of Tor Vergata, Rome, Italy: Peptide libraries presented by the major coat protein of filamentous phages.

J. Scott, The Scripps Research Institute, La Jolla, California: Performance of a hexapeptide epitope library.

R.A. Houghten, Torrey Pines Institute for Molecular Studies, San Diego, California: The use of synthetic peptide combinatorial libraries for drug discovery and basic research.

SESSION 3: Methods and Alternative Displays

- J.A. Wells, Genentech, Inc., South San Francisco, California: Applications of phage display technology for high-affinity and receptor selective hormone analogs.
- W. Mandecki, Abbott Laboratories, Abbott Park, Illinois: Strategies for evolving novel proteins.
- J.A. Sorge, Stratagene, La Jolla, California: λ 13ZAP: Filamentous surface expression with the efficiency of λ

- packaging.
- W. Szybalski, McArdle Laboratory for Cancer Research, University of Wisconsin, Madison: Phage λ vectors.
- M. Uhlen, Royal Institute of Technology, Stockholm, Sweden: Display of recombinant proteins on the surface of gram-positive bacteria.

SESSION 4: Antibodies on Phage

- C.F. Barbas, The Scripps Research Institute, La Jolla, California: Combinatorial antibody libraries on the surface of phage: Opportunities in therapy and antibody engineering.
- D. Burton, The Scripps Research Institute, La Jolla, California: Phage surface antibody libraries to select anti-viral antibodies.
- D.J. Chiswell, Cambridge Antibody Technology Limited,

- United Kingdom: Phage display of functional protein domains: Isolation and improvement of antibodies.
- L.J. Garrard, Genentech, Inc., South San Francisco, California: Generation of and selection from Fab phage display libraries.
- M. Little, German Cancer Research Center, Heidelberg, Germany: Surface expression of antibodies on phagemid particles.

SESSION 5: Other Proteins on Phage

- M. Zoller, Genentech, Inc., South San Francisco, California: Phage display and mutagenesis of human tumor necrosis factor.
- C.S. Craik, University of California, San Francisco: Trypsin phage: Display of a proteolytic enzyme.
- C. Hession, Biogen, Cambridge, Massachusetts: Phage display of VCAM-1 domains: Epitope mapping of VCAM-1 antibodies.

- R.C. Ladner, Protein Engineering Corp., Cambridge, Massachusetts: Engineering neutrophil elastase inhibitors.
- H. Lowman, Genentech, Inc., South San Francisco, California: Selection of variants of human growth hormones from random libraries using monovalent phage display.
- J. Winter, Sandoz Crop Protection, Palo Alto, California: A model system for surrogate receptor evaluation.

SESSION 6: Peptides on Phage

- R. Cortese, IRBM, Rome, Italy: Construction of epitope libraries.
- V.A. Petrenko, Research and Technology Institute, Berdsk, Russia: Inserting foreign peptides into the major coat protein of bacteriophage M13.
- R. Hoess, The Du Pont Merck Pharmaceutical Company, Wilmington, Delaware: Using constrained peptide libraries

- for epitope mapping and receptor binding.
- R.N. Perham, University of Cambridge, United Kingdom: Display of foreign peptides on the surface of engineered bacteriophage fd: Immunological and other properties.
- B. Malcolm, Chiron Corporation, Emeryville, California: Simplified construction and assessment of peptide libraries in bacteriophage.



M. Zoller, G. Smith, Guest, R. Houghten

Workshop on Human Genetics and Genome Analysis

February 23–February 26

FUNDED BY

Office of Health and Environmental Research, U.S. Department of Energy

ARRANGED BY

M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York

D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory, New York

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York

SESSION 1

D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Mendelian view of the gene.

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York: Modern view of the gene.

T.H. Murray, Case Western Reserve University School of Medicine, Cleveland, Ohio: Ethical implications of human molecular genetics.

SESSION 2

D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory: DNA restriction enzymes and restriction mapping.



D. Erickson, M. Bloom

SESSION 3

- M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Cloning genes.
J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York: Human molecular genetics and inherited disorders.

SESSION 4

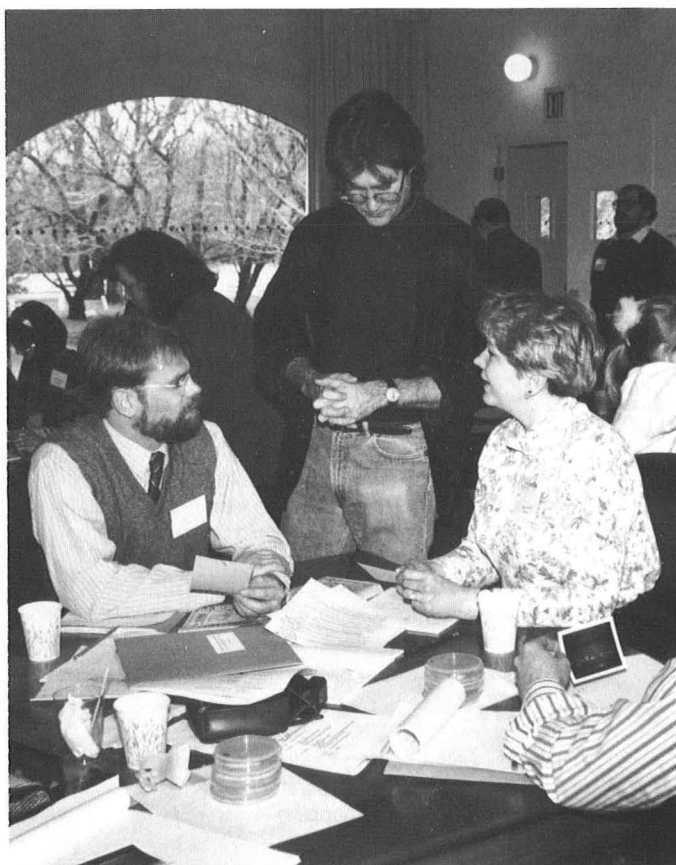
- D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory: Transformation of *E. coli* with plasmid DNA.
M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory: Human DNA fingerprinting by polymerase chain reaction.

SESSION 5

- E. Fearon, Johns Hopkins University School of Medicine, Baltimore, Maryland: Analyzing the molecular genetics of cancer.
D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory results: Transformation of *E. coli* with plasmid DNA.
M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory results: DNA fingerprinting by polymerase chain reaction.

SESSION 6

- K. Culver, National Institutes of Health, Bethesda, Maryland: The first human gene therapy trials.
J.D. Watson, National Center for Human Genome Research, Bethesda, Maryland; Cold Spring Harbor Laboratory, New York: The Human Genome Project.



K. Culver, D. Micklos, S. Cutshall

Congressional/Science Journalists Workshop on Occupational and Environmental Health

April 10–April 12

FUNDED BY

Alfred P. Sloan Foundation

ARRANGED BY

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York

SESSION 1

- P. Landrigan, Mt. Sinai Medical School, New York, New York: How serious is the problem and what are the economic consequences?

N.A. Ashford, Center for Technology, Policy and Industrial Development, Massachusetts Institute of Technology, Cambridge: Legal and regulatory issues in environmental and occupational health.

B.D. Goldstein, Environmental and Occupational Health Sciences Institute, Piscataway, New Jersey: Physicians: Environmental and occupational health.

SESSION 2

M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory: DNA experiment.

SESSION 3

K. Rest, Occupational Health Program, University of Massachusetts Medical Center, Amherst: Ethical aspects of occupational and environmental health.

F.W. Mirer, International Union, United Automobile Workers, Detroit, Michigan: A practical approach to preventing occupational injury and illness.

D.P. Rall, Washington, D.C.: What can be done? The responsibilities and activities of federal agencies.



G. Ellis, J. Witkowski



D. Liskowski, R. Borchelt, D. Vogt

Indirect Costs and the Independent Research Institute

April 30–May 1

ARRANGED BY

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

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York

SESSION 1: Indirect Costs At Research Institutions

Chairperson: M.F. Singer, Carnegie Institution of Washington, D.C.

M.F. Singer, Carnegie Institution of Washington, D.C.: Introductory remarks

W. Keen, Cold Spring Harbor Laboratory, New York: Summary and review of questionnaire.

SESSION 2: Audits

Chairperson: F.J. McKay, Fox Chase Cancer Center, Philadelphia, Pennsylvania

J. O'Neill, KPMG Peat Marwick, Washington, D.C.: Audits of indirect costs at universities.

R.D. Leedy, Fox Chase Cancer Center, Philadelphia, Pennsylvania, and L.A. Keinath, The Wistar Institute, Philadelphia, Pennsylvania: Audits of indirect costs at research institutions.

SESSION 3: Perspectives on Washington

Chairperson: J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York

M.F. Singer, Carnegie Institution of Washington, D.C.: A view from the NIH Subcommittee on Indirect Costs.

J. Pratt, The Whitehead Institute, Cambridge, Massachusetts: Congressional players and legislative activities.

SESSION 4: Future Strategies and General Discussion

Chairperson: G.M. Browne, Cold Spring Harbor Laboratory, New York

G. Schiff, James N. Gamble Institute of Medical Research, Cincinnati, Ohio: Role of AIRI.

Molecular Mechanisms of Viral Latent Infections

July 6–July 9

FUNDED BY

Cold Spring Harbor Laboratory Corporate Sponsor Program

ARRANGED BY

B. Roizman, University of Chicago, Illinois

SESSION 1: Herpesviruses I

Chairperson: B. Roizman, University of Chicago, Illinois

B. Roizman, University of Chicago, Illinois: Introduction.
E. Kieff, Harvard Medical School, Boston, Massachusetts:
EBV latency.

G.I. Miller, Jr., Yale University School of Medicine, New Haven, Connecticut: Mechanism of the ZEBRA protein in the switch between latency and lytic replication of EBV.

P. Lai, Tampa Bay Research Institute, St. Petersburg, Florida: Cellular proteins that bind to ori-p sequence of EBV genome.

E.S. Mocarski, Stanford University School of Medicine, California: CMV latency.

SESSION 2: Herpesviruses II

Chairperson: E. Kieff, Harvard Medical School, Boston, Massachusetts

N. Frenkel, Tel Aviv University, Ramat Aviv, Israel: Latency and reactivation of human herpesviruses 6 and 7: In vivo and in culture.

A.Y. Sears, University of Chicago, Illinois: Function of host-specific origins of viral DNA replication in HSV latency.

J.G. Stevens, University of California, Los Angeles: HSV ge-

netic expression during establishment, maintenance, and reactivation from latent infection.

J. Hay, State University of New York, Buffalo, School of Medicine: Expression of varicella zoster virus genes in neural tissues.



Meeting participants

SESSION 3: Papillomaviruses

Chairperson: H.S. Ginsberg, Columbia University College of Physicians & Surgeons, New York, New York

H. zur Hausen, Deutsches Krebsforschungszentrum, Heidelberg, Germany: Host cell control of papillomavirus genome persistence.

S. Vande Pol, National Cancer Institute, Bethesda, Maryland: The bovine papillomaviruses constitutive en-

hancer is essential for transformation, DNA replication, and the maintenance of latency.

L. Laimins, University of Chicago, Illinois: Regulation of human papillomavirus life cycle differentiating epithelium.

SESSION 4: RNA Viruses I

Chairperson: I.S.Y. Chen, University of California, Los Angeles, School of Medicine

I.S.Y. Chen, University of California, Los Angeles, School of Medicine: Incomplete reverse transcription as a mechanism for HIV-1 low-level persistence in T cells.

B.R. Cullen, Howard Hughes Medical Institute, Duke University Medical Center, Durham, North Carolina: Role of REV in lentiviral latency.

SESSION 5: RNA Viruses II

Chairperson: I.S.Y. Chen, University of California, Los Angeles, School of Medicine

W. Greene, University of California, San Francisco: Molecular analysis of HIV-1 "latency": Role of cellular transcription factors in viral activation.

A.T. Haase, University of Minnesota, Minneapolis: New ex-

perimental tools for the analysis of viral latency.

M. Stevenson, University of Nebraska Medical Center, Omaha: Preintegration events influencing HIV-1 latency.

SESSION 6: Other RNA Viruses

Chairperson: R.M. Chanock, National Institute of Allergy and Infectious Diseases, Bethesda, Maryland

J.C. de la Torre, The Scripps Research Institute, La Jolla, California: Disturbances in host's differentiated functions caused by a noncytolytic virus.

M.L. Nibert, Harvard Medical School, Boston, Massachu-

setts: Persistent infections of murine L cells with mammalian reoviruses: Coevolution of cells and viruses during maintenance of persistent infection involves a specific early step in the infectious cycle.

SESSION 7: AAV; Adenoviruses

Chairperson: K.I. Berns, Cornell University Medical College, New York, New York

K.I. Berns, Cornell University Medical College, New York, New York: Integration and rescue of AAV from the integrated site.

R.J. Samulski, University of Pittsburgh, Pennsylvania: AAV latent infection.

H.S. Ginsberg, Columbia University College of Physicians &

Surgeons, New York, New York: "How adenoviruses persist."

W.S.M. Wold, St. Louis University Medical Center, Missouri: Adenovirus proteins that counteract CTL and TNF/macrophage-mediated immunosurveillance.

Oligonucleotide Manipulation of Gene Expression: Its Therapeutic Potential

October 13–October 16

FUNDED BY

Cold Spring Harbor Laboratory Corporate Sponsor Program

ARRANGED BY

M. Matteucci, Gilead Sciences, Inc., Foster City, California

SESSION 1: Mechanistic, Tissue Culture, and In Vivo Antisense Results I

Chairperson: **M. Matteucci**, Gilead Sciences, Inc., Foster City, California

- | | |
|---|--|
| <p>L. Neckers, National Cancer Institute, Bethesda, Maryland: In vivo continuous intrathecal infusion of oligonucleotides: Pharmacokinetics and efficacy.</p> <p>G. Zon, Applied Biosystems, Inc., Foster City, California: Recent investigations of antisense phosphorothioate oligodeoxynucleotides.</p> <p>Y.-C. Cheng, Yale University School of Medicine, New Haven, Connecticut: Cellular and molecular pharmacology of phosphorothioate oligodeoxynucleotides.</p> | <p>C. Stein, Columbia University College of Physicians & Surgeons, New York, New York: Pathways of oligonucleotide internalization in hematopoietic cell lines.</p> <p>R.W. Wagner, Gilead Sciences, Inc., Foster City, California: Understanding hurdles in oligonucleotide antisense development.</p> <p>B. Lebleu, Universite Montpellier II, Montpellier Cedex, France: Cell targeting, transmembrane passage, and intracellular distribution of antisense oligonucleotides.</p> |
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SESSION 2: Mechanistic, Tissue Culture, and In Vivo Antisense Results II

Chairperson: **P.S. Miller**, The Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland

- | | |
|--|---|
| <p>S. Agrawal, Hybridon, Inc. Worcester, Massachusetts: Oligonucleotide phosphorothioates as antiviral agents.</p> <p>R. Juliano, University of North Carolina School of Medicine, Chapel Hill: Cellular uptake and intracellular distribution of chemically modified oligonucleotides.</p> <p>L. Arnold, Genta Inc., San Diego, California: Development of antisense therapeutic agents.</p> <p>D.J. Chin, Agouron Institute, La Jolla, California: Hybrid complexes in living cells studied by fluorescence energy</p> | <p>transfer.</p> <p>J.-J. Toulme, Universite de Bordeaux II, Bordeaux Cedex, France: Efficiency and selectivity of RNase-H-mediated inhibition of translation and reverse transcription by antisense oligonucleotides.</p> <p>A.M. Krieg, University of Iowa, Iowa City: Effects of oligonucleotide modification on cell binding, uptake, and antisense efficacy.</p> |
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SESSION 3: New Structural Modifications of Oligonucleotides I

Chairperson: **M.H. Caruthers**, University of Colorado, Boulder

- | | |
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| <p>P.S. Miller, The Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland: Interaction of base analogs with dsDNA.</p> <p>C.K. Mirabelli, ISIS Pharmaceuticals, Carlsbad, California: Pharmacokinetics of chemically modified oligonucleotides: Impact on therapeutic uses.</p> <p>J.A. Walder, University of Iowa, Iowa City: Synthesis and</p> | <p>therapeutic applications of new achiral oligonucleotide analogs.</p> <p>G. Trainor, The Du Pont Merck Pharmaceutical Company, Wilmington, Delaware: Oligonucleotide analogs with sulfamate and sulfamid internucleotide linkages.</p> <p>H.E. Moser, Ciba-Geigy AG, Basel, Switzerland: Carbocyclic oligonucleotides: Synthesis and properties.</p> |
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C. Mirabelli, E. Saison-Behmoaras

SESSION 4: New Structural Modifications of Oligonucleotides II

Chairperson: J.A. Walder, University of Iowa, Iowa City

P.E. Nielsen, The Panum Institute, Copenhagen, Denmark: Sequence-specific DNA recognition by peptide nucleic acid chimera.

L.E. Babiss, Glaxo, Inc., Research Triangle Park, North Carolina: Antisense and antigenic potentials of peptide nucleic acid oligomers.

M.H. Caruthers, University of Colorado, Boulder: Synthesis, biochemistry, and biological applications of new

polynucleotide analogs.

J.H. van Boom, State University Leiden, The Netherlands: A study directed toward the preparation and hybridization potential of DNA fragments containing internucleosidic methylene acetal bonds at predetermined positions.

E. Saison-Behmoaras, INSERM/CRS, Paris, France: Selective inhibition of mutation Ha-ras expression by antisense oligonucleotides.

SESSION 5: Triple Helix Results

Chairperson: H.E. Moser, Ciba-Geigy AG, Basel, Switzerland

M. Matteucci, Gilead Sciences, Inc., Foster City, California: Phosphodiester analogs of oligonucleotides.

M.E. Hogan, Baylor College of Medicine, The Woodlands, Texas: Triplex forming oligonucleotides.

J. Klysik, Texas A&M University, Houston: DNA triplexes.

L.-S. Kan, The Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland: How to increase

the stability of triplex formation.

S.F. Singleton, California Institute of Technology, Pasadena: An analysis of the energetics of triple helix formation using quantitative affinity cleavage titration.

D.J. Patel, Columbia University College of Physicians & Surgeons, New York, New York: Solution structure of Y-RY and R-RY DNA triplexes.



DNA Repeats and Human Gene Mutations

October 18–October 21

FUNDED BY

U.S. Department of Energy

ARRANGED BY

M. Radman, Institut Jacques Monod, Paris, France

S.T. Warren, Howard Hughes Medical Institute, Emory University School of Medicine, Atlanta, Georgia

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York

SESSION 1: Human Genome: Fragile X

Chairperson: M. Radman, Institut Jacques Monod, Paris, France

S.L. Sherman, Emory University, Atlanta, Georgia: Population dynamics of the fragile-X mutation.

D.L. Nelson, Baylor College of Medicine, Houston, Texas: Structure of the CGG repeats in FMR-1.

R.I. Richards, Adelaide Children's Hospital, North Adelaide, South Australia: Trinucleotide repeats in human genes: Inclusion by chance or necessity—Common properties of

disorders caused by dynamic mutation.

J.-L. Mandel, LGME/CNRS, INSERM U184, Strasbourg, France: Phenomenology of mutation and methylation in fragile-X syndrome.

K.E. Davies, John Radcliffe Hospital, Oxford, United Kingdom: Methylation, fragile sites, and instability.

SESSION 2: Myotonic Dystrophy

Chairperson: S.T. Warren, Emory University School of Medicine, Atlanta, Georgia

D. Shaw, University of Wales College of Medicine, Cardiff: Myotonic dystrophy—Analysis of the mutation and speculations on nature of gene product.

K. Johnson, Charing Cross and Westminster Medical School, London, United Kingdom: Characterization of the CTG repeat in myotonic dystrophy patients.

SESSION 3: Spinal Bulbar Muscular Atrophy

Chairperson: S.T. Warren, Emory University School of Medicine, Atlanta, Georgia

K.H. Fischbeck, University of Pennsylvania Medical School, Philadelphia: The molecular genetics of X-linked spinal and bulbar muscular atrophy.

J.-L. Mandel, LGME/CNRS, INSERM U184, Strasbourg, France: Instability in SBMA.

SESSION 4: Other Sequences

Chairperson: D.L. Nelson, Baylor College of Medicine, Houston, Texas

R.M. Cawthon, University of Utah Medical Center, Salt Lake City: Mutations in two tumor suppressor genes: Neurofibromatosis 1 and adenomatous polyposis coli.

S.S. Sommer, Mayo Clinic/Foundation, Rochester, Minnesota: The underlying pattern of spontaneous human germ-line mutation: Lessons from the factor IX gene.

M. Schalling, Massachusetts Institute of Technology, Cambridge: Detection of novel expanded repeats and expression of repeat containing genes.

S.T. Warren, Emory University School of Medicine, Atlanta, Georgia: Repeat sequences in other genes.

SESSION 5: Data from Other Genomes

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

T.D. Petes, University of North Carolina, Chapel Hill: Genetic control of the stability of simple repetitive yeast DNA sequences.

J. Armour, University of Leicester, United Kingdom: Repeat unit turnover at human minisatellite loci.

M. Radman, Institut Jacques Monod, Paris, France: Homologous DNA interactions in the evolution of gene and chromosome structure.

M.A. Resnick, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Genome stability: The interaction between recombination, repair, and cell signaling.

R.D. Wells, Texas A&M University, Houston: Unusual DNA structures and repeat sequences.

R.R. Sinden, Texas A&M University, Houston: The impact of DNA secondary structure on mutations and preferential mutagenesis of leading and lagging strands.

M.S. Fox, Massachusetts Institute of Technology, Cambridge: Mismatch repair and mutation avoidance in *E. coli*.

R.M. Liskay, Yale University School of Medicine, New Haven, Connecticut: Multiple homologs of a DNA mismatch repair gene (*MutL*) in mammals and yeast.

SESSION 6: Generation of Sequence Polymorphisms

Chairperson: K.E. Davies, John Radcliffe Hospital, Oxford, United Kingdom

E.U. Selker, University of Oregon, Eugene: Inactivation of duplicated genes in fungi.

G. Faugeron, University of Paris-South, Orsay, France: Cytosine methylation and gene silencing triggered by DNA repeats.

P. Kourilsky, INSERM U277, Paris, France: The extensive

polymorphism of the major transplantation antigens and its possible relationship with the CpG content of MHC genes.

T.P. Yang, University of Florida College of Medicine, Gainesville: High-resolution methylation analysis of the FMR-1 repeat by genomic sequencing.

SESSION 7: Recombination in Mammalian Genes

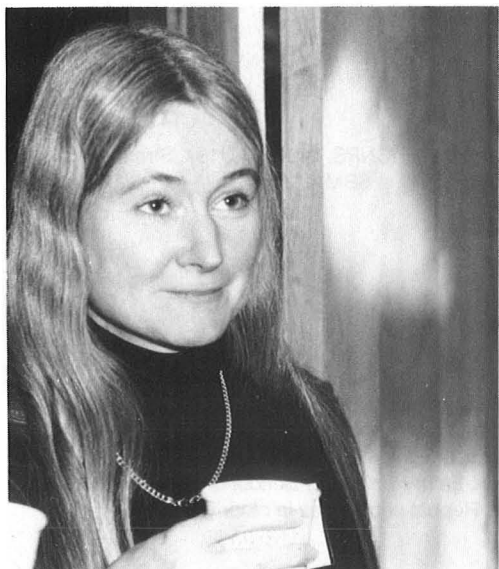
Chairperson: K.E. Davies, John Radcliffe Hospital, Oxford, United Kingdom

R.S. Kucherlapati, Albert Einstein College of Medicine, Bronx, New York: Manipulating the mammalian genome through homologous recombination.

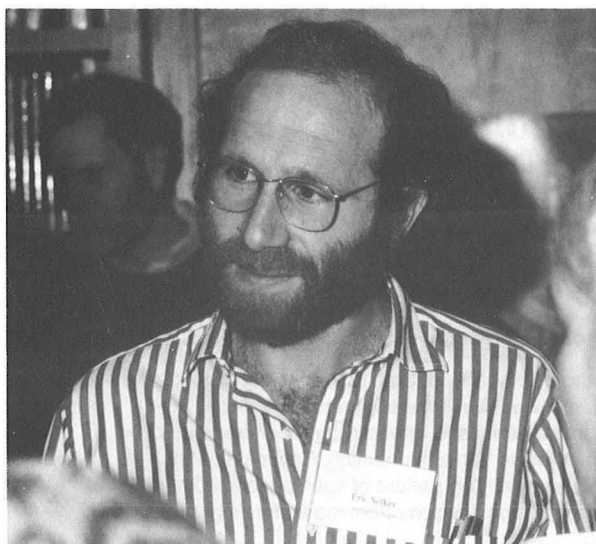
H. Eisen, Fred Hutchinson Cancer Research Center, Seattle, Washington: Use of pseudogenes and recombination in

the generation of diversity and ordered gene expression.

J.-C. Weill, Institut Necker, Paris, France: Molecular mechanisms involved in the generation of antibody diversity (gene conversion, somatic mutation).



K. Davies



E. Selker

Control of HIV Gene Expression

October 24–October 27

FUNDED BY

Cold Spring Harbor Laboratory Corporate Sponsor Program, Repligen Corporation, Merck Research Laboratories, and Hoffmann-La Roche Inc.

ARRANGED BY

B.R. Cullen, Howard Hughes Medical Institute, Duke University Medical Center, Durham, North Carolina

R. Franza, Cold Spring Harbor Laboratory, New York

F. Wong-Staal, University of California, San Diego, School of Medicine, La Jolla

SESSION 1: Infection and Integration

Chairperson: R. Franza, Cold Spring Harbor Laboratory, New York

J.P. Moore, The Aaron Diamond AIDS Research Center, New York University School of Medicine, New York: Envelope glycoprotein of HIV-1: Roles of HIV-1 entry into CD4⁺ cells and neutralization thereof.

D.R. Littman, University of California, San Francisco: Role of CD4 in HIV entry and pathogenesis.

H.E. Varmus, University of California, San Francisco, School of Medicine: Retroviral integration.

M. Stevenson, University of Nebraska Medical Center, Omaha: Nuclear import of HIV-1 preintegration complexes: Cell cycle dependence.

M.A. Martin, National Institute of Allergy and Infectious Diseases, Bethesda, Maryland: Cell-to-cell virus spread.

M. Emerman, Fred Hutchinson Cancer Research Center, Seattle, Washington: HIV infection of nondividing cells.

SESSION 2: Cellular Factors

Chairperson: H.E. Varmus, University of California, San Francisco, School of Medicine

R. Franza, Cold Spring Harbor Laboratory, New York: Differential expression of KB-binding protein and their cellular associates.

A.S. Baldwin, University of North Carolina, Chapel Hill: Control of NF- κ B activity.

P.A. Baeuerle, Genzentrum de LMU, Martinsried, Germany: Oxidative stress and the activation of NF- κ B and HIV.

G.J. Nabel, Howard Hughes Medical Institute, University of Michigan Medical Center, Ann Arbor, Michigan: Role of NF- κ B in HIV transcriptional initiation and virus replication.

W.C. Greene, Howard Hughes Medical Institute, Gladstone Institute of Virology and Immunology, San Francisco, California: NF- κ B and the regulation of HIV-1 gene expression.

R.G. Roeder, The Rockefeller University, New York, New York: Role of cellular factors in basal and Tat-induced HIV transcription.

N. Hernandez, Cold Spring Harbor Laboratory, New York: Formation of short transcripts in the HIV-1 LTR.

SESSION 3: Tat and Rev I

Chairperson: F. Wong-Staal, University of California, San Diego, School of Medicine, La Jolla

B.R. Cullen, Howard Hughes Medical Institute, Duke University Medical Center, Durham, North Carolina: Recent insights into HIV-Rev function.

R. Gaynor, University of Texas Southwestern Medical School, Dallas: HIV DNA and RNA binding proteins.

K.A. Jones, The Salk Institute, La Jolla, California: HIV-1 transcription: Tat, TAR, and cellular factors.

B.M. Peterlin, Howard Hughes Medical Institute, University

of California, San Francisco: Tat and transcriptional regulation of HIV.

M.F. Laspias, Cold Spring Harbor Laboratory, New York: *Trans*-activation of transcription by Tat.

J. Karn, MRC Laboratory of Molecular Biology, Cambridge, United Kingdom: Tat and rev: Chemistry of RNA binding and biological properties in vivo and in vitro.



D. Littman, B. Cullen

SESSION 4: Tat and Rev II

Chairperson: B.R. Cullen, Howard Hughes Medical Institute, Duke University Medical Center, Durham, North Carolina

F. Wong-Staal, University of California, San Diego, School of Medicine, La Jolla: Role of NF_{RRE} in HIV replication and latency.

M. Zapp, University of Massachusetts Medical Center, Worcester: Mechanisms of Tat and Rev action.

A. Frankel, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts: Structural determinants of Tat and Rev RNA recognition.

T.G. Parslow, University of California, San Francisco: REV and REX.

J. Hauber, Sandoz Research Institute, Vienna, Austria: Functional analysis of the HIV-1 Rev *trans*-activator.

G.N. Pavlakis, National Cancer Institute-Frederick Cancer Research and Development Center, Frederick, Maryland: Rev protein counteracts inhibitory/instability sequences throughout the HIV-1 genome.

SESSION 5: Other Aspects

Chairperson: M.A. Martin, National Institute of Allergy and Infectious Diseases, Bethesda, Maryland.

R.C. Desrosiers, Harvard Medical School, Southborough, Massachusetts: The importance of "nonessential" genes for AIDS pathogenesis.

J. Skowronski, Cold Spring Harbor Laboratory, New York: HIV-1 *nef* gene and T-cell activation.

H. Goettlinger, Dana-Farber Cancer Institute, Cambridge, Massachusetts: New insights regarding the function of the

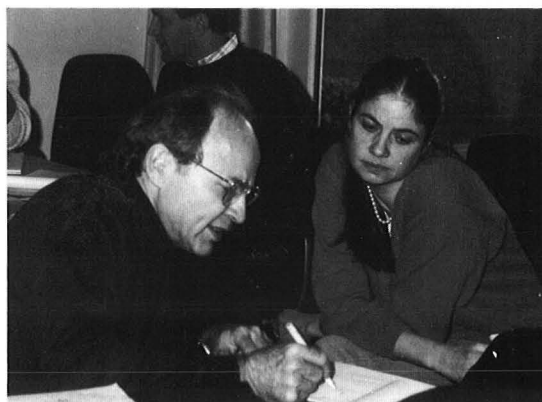
HIV-1 regulatory protein *vpu*.

M.H. Malim, Howard Hughes Medical Institute, University of Pennsylvania School of Medicine, Philadelphia: Inhibition of HIV-1 replication using transdominant mutants of the viral Rev *trans*-activator.

E. Gilboa, Sloan-Kettering Institute, New York, New York: Intracellular immunization against HIV using RNA decoys.



R. Desrosiers, J. Skowronski



K. Roeder, N. Hernandez

Baring Brothers/Cold Spring Harbor Laboratory Executive Conference on Aging

October 30–November 1

ARRANGED BY

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

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York

SESSION 1

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

R.N. Butler, The Mt. Sinai Medical Center, New York, New York: The longevity revolution.

SESSION 2

G.M. Martin, University of Washington School of Medicine, Seattle: Implications of evolutionary theory for human aging.

B.N. Ames, University of California, Berkeley: Mechanisms of aging: Oxidation.

SESSION 3

D. Micklos and M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory: DNA fingerprinting by PCR.

SESSION 4

S.B. Prusiner, University of California, San Francisco, School of Medicine: Prions and neurodegenerative diseases.

D.L. Price, The Johns Hopkins University School of Medicine, Baltimore, Maryland: Neurotrophic factors and aging of the central nervous system.

C. Greider, Cold Spring Harbor Laboratory, New York: Exciting developments in aging research at Cold Spring Harbor.

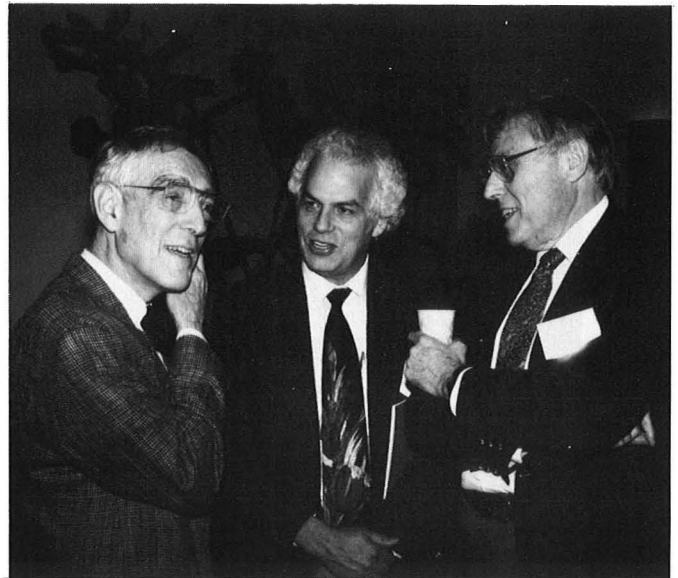
SESSION 5

D.J. Selkoe, Harvard Medical School, Brigham and Women's Hospital, Boston, Massachusetts: Amyloid protein and the molecular mechanism of Alzheimer's disease.

A.D. Roses, Duke University Medical Center, Durham, North Carolina: Alzheimer's disease: Unraveling the genetics.

D. Micklos and M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York: DNA fingerprinting results.

D.E. Redmond, Jr., Yale University School of Medicine, New Haven, Connecticut: Fetal tissue transplantation and Parkinson's disease.



B. Ames, S. Prusiner, G. Martin

Funding for the Decade of the Brain

November 4–November 6

FUNDED BY

Charles A. Dana Foundation

ARRANGED BY

W.M. Cowan, Howard Hughes Medical Institute, Bethesda, Maryland

K.R. Jamison, Washington, D.C.

F. Plum, Cornell University Medical College, New York, New York

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

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York

SESSION 1: The Decade of the Brain: Impact on Research

Discussion Leader: H. Pardes, New York State Psychiatric Institute, New York

Review of the genesis, intent, and funding of the Proclamation on the Decade of the Brain.

L.L. Judd, University of California, San Diego, School of Medicine, La Jolla

How the National Institutes of Health have been able to respond.

M. Goldstein, National Institute of Neurological Diseases and Stroke, Bethesda, Maryland

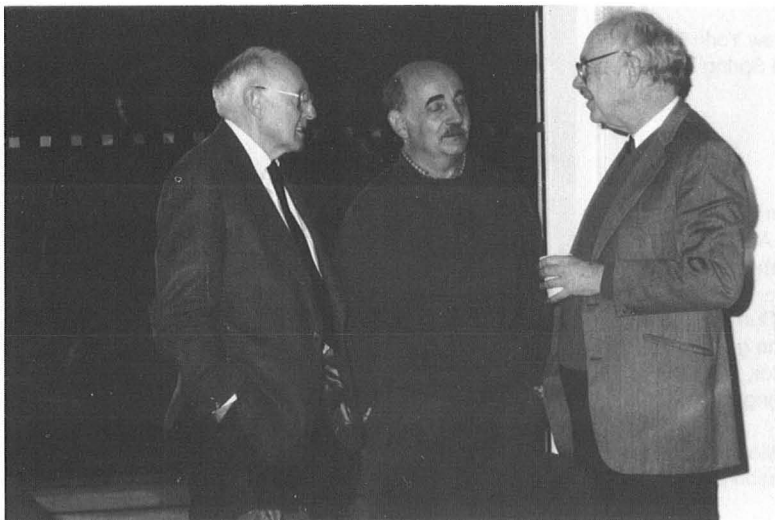
Impact on the academic community.

R.C. Collins, University of California, Los Angeles

J.B. Martin, University of California, San Francisco, School of Medicine

S.J. Ryan, University of Southern California Medical School, Los Angeles

J.D. Barchas, University of California, Los Angeles, School of Medicine



W. M. Cowan, A. Aguayo, J. Watson

SESSION 2: The Decade of the Brain: Who Needs to be Persuaded of Its Importance?

Discussion Leader: G.M. McKhann, Johns Hopkins University, Baltimore, Maryland

(A) Are there useful models for the Battle for the Brain?

The war on cancer

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

The Human Genome Project

R. Cook-Deegan, National Academy of Sciences, Washington, D.C.

Alzheimer's disease

N.G. Cavarocchi, CR Associates, Washington, D.C.

The scientific community; Congress; the media; advocacy groups

K.R. Jamison, Washington, D.C.

Reaching out to influential members of business and media

D. Mahoney, The Charles A. Dana Foundation, New York, New York

(B) Strategies for arousing the public's interest and enthusiasm

The fascination of knowing how the normal mind works

G.M. McKhann, Johns Hopkins University, Baltimore, Maryland

Targeting diseases

D.J. Selkoe, Harvard Medical School, Brigham and Women's Hospital, Boston, Massachusetts

E..M. Shooter, Stanford University School of Medicine, California

Economic arguments

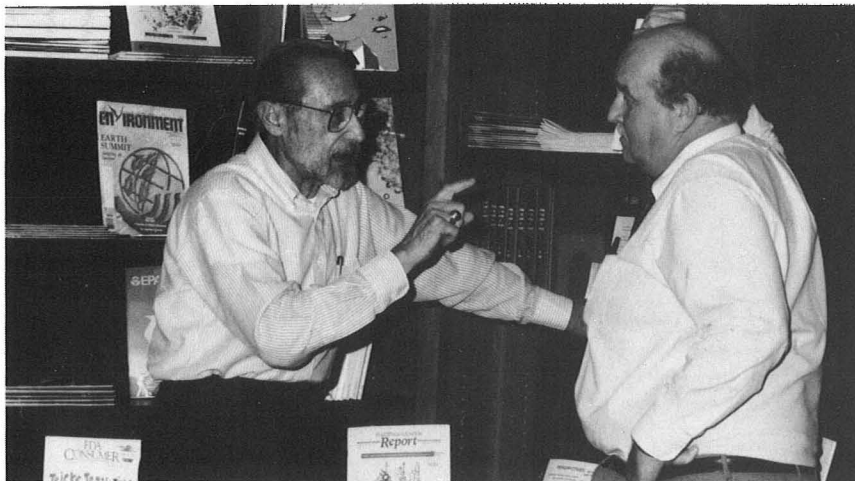
R.J. Wyatt, National Institute of Mental Health Neuroscience Center at St. Elizabeth's, Washington, D.C.

SESSION 3: How to Reach Specific Groups?

Discussion Leader: R.M. Rose, The John D. & Catherine T. MacArthur Foundation, Chicago, Illinois

Advocacy groups and the scientific community

H. Pardes, New York State Psychiatric Institute, New York Foundations



M. Goldstein, B. Metheny

R.M. Rose, The John D. & Catherine T. MacArthur Foundation, Chicago, Illinois

D. Mahoney, The Charles A. Dana Foundation, New York, New York

Congress: Who are the key figures?

F.K. Goodwin, National Institute of Mental Health, Rockville, Maryland

B. Metheny, South Dartmouth, Massachusetts

SESSION 4: Determination of Specific Goals

Discussion Leader: F. Plum, Cornell University Medical College, New York, New York

General Discussion:

Setting goals that have a high priority in terms of their inherent interest and importance and that have the potential for exciting public support for the whole of the Decade of the Brain program. This discussion emphasized (a) topics where funding would make a significant difference; (b) why a major effort should be made to achieve these goals; (c) how to ensure that the commitment to these goals is maintained; and (d) how to ensure that the progress made is used to further the aims of the project.

SESSION 5: Consolidation of Goals

Discussion Leader: W.M. Cowan, Howard Hughes Medical Institute, Bethesda, Maryland

General Discussion

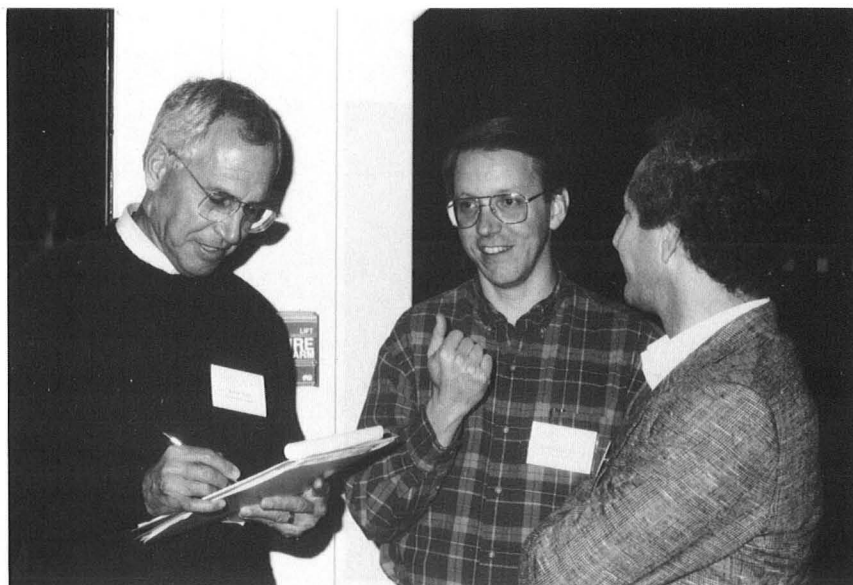
HOW CAN THE efforts and results of the present meeting be used best?

What should be done by federal institutes, academic associations, and foundations to further the aims of the Decade of the Brain?

Can these efforts be coordinated?

What are the political dimensions?

What political strategies need to be pursued (lobbying)?



R. Rose, R. Cook-Deegan

Superantigens and Antigenic Presentation

November 8–November 11

FUNDED BY

Cold Spring Harbor Laboratory Corporate Sponsor Program

ARRANGED BY

B.T. Huber, Tufts University School of Medicine, Boston, Massachusetts

E. Palmer, National Jewish Center, Denver, Colorado

SESSION 1: Bacterial SAG/MHC/TCR Interaction

Chairperson: **R.J. Hodes**, National Cancer Institute, Bethesda, Maryland

J.W. Kappler, Howard Hughes Medical Institute, National Jewish Center, Denver, Colorado: Structural features of superantigens.

S. Swaminathan, VA Medical Center, Pittsburgh, Pennsylvania: The crystal structure of staphylococcal enterotoxin B.

J.D. Fraser, University of Auckland School of Medicine, New Zealand: Structural studies of staphylococcal enterotoxins A and E. Functional domains involved in TcR and MHC

binding.

D.R. Karp, University of Texas Southwestern Medical Center, Dallas: Distinct binding sites on HLA-DR for invariant chain and staphylococcal enterotoxins.

R.S. Geha, Children's Hospital, Boston, Massachusetts: Signal transduction via Ia (MHC class II) molecules.

N.S. Braunstein, Columbia University College of Physicians & Surgeons, New York, New York: T-cell recognition of MHC molecules.

SESSION 2: T-cell Interaction with SAG

Chairperson: **E. Palmer**, National Jewish Center, Denver, Colorado

S.R. Webb, The Scripps Research Institute, La Jolla, California: MIs antigens: Immunity and tolerance.

R. Abe, Naval Medical Research Institute, Bethesda, Maryland: Role of superantigens in T-cell receptor-mediated signaling and T cell repertoire selection.

D. Woodland, St. Jude Children's Research Hospital, Memphis, Tennessee: MHC-restricted recognition of superantigens.

M. Blackman, St. Jude Children's Research Hospital, Memphis, Tennessee: Role of the TCR α chain in recogni-

tion of superantigens.

E. Simpson, Clinical Research Centre, Harrow, Middlesex, United Kingdom: Effect of endogenous superantigens on T cell repertoire selection of transgenic mice.

K. Tomonari, Clinical Research Centre, Harrow, Middlesex, United Kingdom: V β repertoire and viral superantigens.

Discussion: R.J. Hodes, National Cancer Institute, Bethesda, Maryland and J. Sprent, The Scripps Research Institute, La Jolla, California



SESSION 3: Retroviral Biology

Chairperson: H. Diggelmann, Swiss Institute for Experimental Cancer Research, Epalinges, Switzerland

S.R. Ross, University of Illinois College of Medicine, Chicago: Endogenous superantigen expression protects mice against MMTV infection.

H. Acha-Orbea, Ludwig Institute for Cancer Research, Lausanne, Switzerland: Infectious minor lymphocyte stimulating antigens.

H.C. Morse, National Institute of Allergy and Infectious Diseases, Bethesda, Maryland: Murine AIDS: Possible role of an MLV superantigen in pathogenesis.

P. Jolicoeur, Clinical Research Institute of Montreal, Quebec, Canada: Is Pr65 GAG protein of the murine AIDS virus a superantigen?

B. T. Huber, Tufts University School of Medicine, Boston, Massachusetts: Biology of MTV-7 SAG expression.

P.-A. Cazenave, Institut Pasteur, Paris, France: Polymorphism of TCR V β regions and clonal deletions in wild mouse populations.

SESSION 4: Control of MMTV Expression

Chairperson: A. Korman, Institut Pasteur, Paris, France

G.J. Thorbecke, New York University Medical Center, New York: MTV-encoded superantigen expression in B lymphoma cells in SJL mice as a stimulus for "reverse immunosurveillance."

J.S. Butel, Baylor College of Medicine, Houston, Texas: Characterization of the MMTV LTR ORF gene product.

R.B. Corley, Duke University Medical Center, Durham, North Carolina: Regulation of MMTV genes and gene products in cells of the B lineage.

W.H. Gunzburg, Institute of Molecular Virology, Neuherberg, Germany: MMTV-encoded *naf* and superantigen activities: Different functions of the same gene?

SESSION 5: Viral Superantigens in Humans

Chairperson: J. Sprent, The Scripps Research Institute, La Jolla, California

D.N. Posnett, Cornell University Medical College, New York, New York: Is HIV-1 associated with a superantigen?

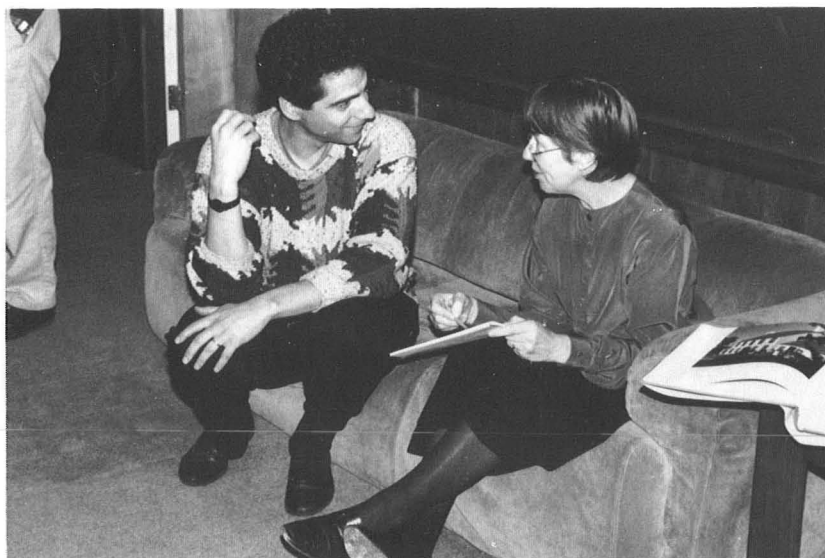
R.-P. Sekaly, Clinical Research Institute of Montreal, Quebec, Canada: Structure-function interaction of bacterial and viral superantigens with human T cells.

D. Primi, Conbiotec-Laboratory of Biotechnology, Brescia, Italy: Role of superantigens in human infections.

M. Lafon, Institut Pasteur, Paris, France: Evidence for a viral superantigen in humans: The rabies virus nucleocapsid.

B.L. Kotzin, National Jewish Center, Denver, Colorado: Superantigens in human autoimmune diseases.

P. Marrack, Howard Hughes Medical Institute, National Jewish Center, Denver, Colorado: Control of V β 3 bearing cells in man.



E. Palmer, E. Simpson

Constructing Organisms

November 13–November 16

FUNDED BY

The Wellcome Trust, Repligen Corporation and Abbott Laboratories

ARRANGED BY

M. Bate, University of Cambridge, United Kingdom

A. Martinez-Arias, University of Cambridge, United Kingdom

SESSION 1: Gene Expression and Allocation of Cell Fates in Early Embryos

E.H. Davidson, California Institute of Technology, Pasadena: Cell interaction and gene expression in the initial specification of lineage founder cells in the sea urchin embryo.

M. Fuller, Stanford University School of Medicine, California: Control of cell division and subcellular morphogenesis during spermatogenesis.

E. Wieschaus, Princeton University, New Jersey: Morphogenetic movements during gastrulation in *Drosophila*.

H. Jaekle, Max-Planck-Institute of Biophysical Chemistry, Göttingen, Germany: Positional information: Complex interactions of transcriptional activators and repressors in *Drosophila*.

T. Doniach, University of California, San Francisco: Induction of anteroposterior neural pattern in *Xenopus*.

S. Cohen, Howard Hughes Medical Institute, Baylor College of Medicine, Houston, Texas: Allocation of the imaginal disc primordia in the *Drosophila* embryo.

G. Jurgens, University of Munich, Germany: Early events in apical-basal pattern formation in the *Arabidopsis* embryo.

N. Hopkins, Massachusetts Institute of Technology, Cambridge: Genetic approaches to early vertebrate development using zebrafish.

SESSION 2: Patterning the Nervous System

M. Bate, University of Cambridge, United Kingdom: Introduction.

T.M. Jessell, Howard Hughes Medical Institute, Columbia University, New York, New York: Signals that control neural cell pattern in vertebrates.

J.A. Campos-Ortega, University of Cologne, Germany: Mechanisms of early neurogenesis.

Y.-N. Jan, Howard Hughes Medical Institute, University of

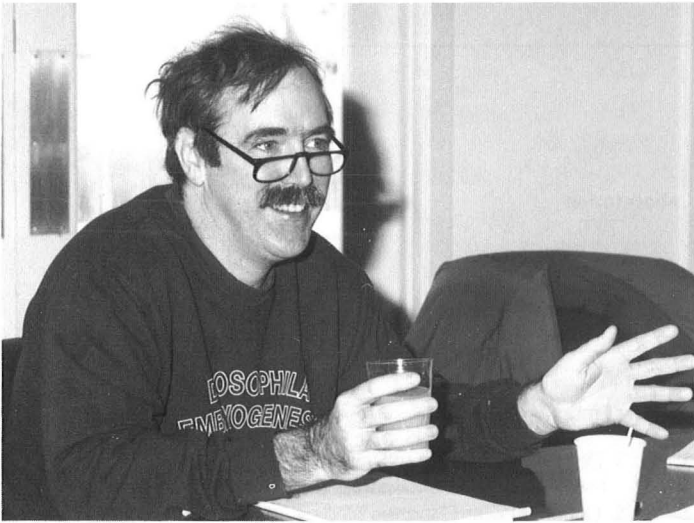
California, San Francisco: Mechanisms shared by neural development, sex determination, and oogenesis in *Drosophila*.

C.Q. Doe, University of Illinois, Urbana: The role of wingless/wrt-1 in *Drosophila* neural precursor formation and specification.

A. McMahon, Roche Institute of Molecular Biology, Nutley, New Jersey: Cell signalling in CNS development.



E. Macagno, N. Hopkins, K. Howard



E. Wieschaus

M.J. Stern, Yale University, New Haven, Connecticut: Conserved signaling systems controlling cell migration and cell fate determination in *C. elegans*.

E. Macagno, Columbia University, New York, New York: Factors affecting the assembly of the nervous system of the leech: Neuron-neuron and neuron-target interactions.

M.C. Raff, University College London, United Kingdom:

Control of a neural cell death and survival.

D. Ready, Purdue University, West Lafayette, Indiana: The cytoskeleton in *Drosophila* eye development.

I.A. Meinertzhagen, Dalhousie University, Halifax, Nova Scotia: Dendritic retraction, sprouting, and reactive synaptogenesis: Evidence for growth factors in the lamina of *Drosophila*?

SESSION 3: Cell Behavior during Development

K. Howard, Roche Institute of Molecular Biology, Nutley, New Jersey: Introduction.

V. Hartenstein, University of California, Los Angeles: Embryonic development of the *Drosophila* head.

J.W. Fristrom, University of California, Berkeley: Functional requirements for changes in cell shape.

H. Skaer, University of Cambridge, United Kingdom: Cell interactions in Malpighian tubule development during *Drosophila* embryogenesis.

M. Ashburner, University of Cambridge, United Kingdom: Concluding remarks.



M. Raff, T. Jessell

Mechanisms of Neuronal Survival: The Action of Neurotrophic Factors

November 19–November 22

FUNDED BY

Cold Spring Harbor Laboratory Corporate Sponsor Program

ARRANGED BY

M. Furth, Regeneron Pharmaceuticals, Inc., Tarrytown, New York

R. McKay, Massachusetts Institute of Technology, Cambridge

SESSION 1: Themes and Variations–Neurotrophins, CNTF, and Beyond

Chairperson: M. Furth, Regeneron Pharmaceuticals, Inc., Tarrytown, New York

M. Furth, Regeneron Pharmaceuticals, Inc., Tarrytown, New York: Introductory remarks.

L.A. Greene, Columbia University College of Physicians & Surgeons, New York, New York: Neurotrophins and survival of cell bodies and axons.

G.D. Yancopoulos, Regeneron Pharmaceuticals, Inc., Tarrytown, New York: The receptors and signaling pathways that neurotrophic factors use to keep neurons alive.

S. Landis, Case Western Reserve University, Cleveland, Ohio: Regulation of neurotransmitter phenotypes by neurokinins.

SESSION 2: Neurotrophins and Their Receptors

Chairperson: G.D. Yancopoulos, Regeneron Pharmaceuticals, Inc., Tarrytown, New York

B. Hempstead, Cornell University Medical College, New York, New York: Functions of NGF receptors.

M. Barbacid, Bristol-Myers Squibb Pharmaceutical Research Institute, Princeton, New Jersey: The *trk* family of neurotrophin receptors.

D.R. Kaplan, National Cancer Institute-Frederick Cancer Research and Development Center, Maryland: Neuronal signal transduction by *trk* receptors.

D. Soppet, National Cancer Institute-Frederick Cancer Research and Development Center, Maryland: Differential responses of *trk* family members to neurotrophins.

C. Ibanez, Karolinska Institute, Stockholm, Sweden: Structure-function relationships of neurotrophins and their receptors.

P. Barker, Stanford University School of Medicine, California: Tissue specific alternative splicing generates two isoforms of the *trkA* receptor

A. Rosenthal, Genentech, Inc., South San Francisco, California: NT-5, and beyond?



SESSION 3: Actions and Regulation of Neurotrophic Factors *In Vivo*

Chairperson: M.E. Hatten, Columbia University College of Physicians & Surgeons, New York, New York

R.M. Lindsay, Regeneron Pharmaceuticals, Inc., Tarrytown, New York: Neurotrophic factors from culture to the clinic.
K. Nikolics, Genentech, Inc. South San Francisco, California: Developmental regulation of neurotrophin receptors.
H. Persson, Karolinska Institute, Stockholm, Sweden: Regulation of neurotrophins and their receptors.
F. Hefti, University of Southern California, Los Angeles: Physiological role and neuroprotective actions of neurotrophins in the adult brain.

C. Gall, University of California, Irvine: Regulation of neurotrophin expression: Evidence for cellular specificity in the response properties of forebrain neurons.
F.H. Gage, University of California, San Diego, La Jolla: Cell survival and regeneration in the adult brain.
L. Williams, The Upjohn Company, Kalamazoo, Michigan: Effects of NGF on cholinergic transmission in the young and aged rat.

SESSION 4: Interactions of Neuronal Precursors and Neurotrophic Factors

Chairperson: S. Landis, Case Western Reserve University, Cleveland, Ohio

D.J. Anderson, Howard Hughes Medical Institute, California Institute of Technology, Pasadena: Acquisition of NGF-responsiveness and NGF-dependence by embryonic sympathetic neurons.
S. Weiss, University of Calgary, Alberta, Canada: Growth factor regulation of CNS stem cells and progeny *in vitro*.
M.E. Hatten, Columbia University College of Physicians &

Surgeons, New York, New York: Control of cerebella granule cell neurogenesis and differentiation.
D. Lindholm, Max-Planck-Institute for Psychiatry, Munich, Germany: Neurotrophins in rat cerebellum: Action and regulation.
R. McKay, Massachusetts Institute of Technology, Cambridge: Neurotrophin responses in CNS precursor cells.

SESSION 5: Signal Transduction Mechanisms

Chairperson: M. Barbacid, Bristol-Myers Squibb Pharmaceutical Research Institute, Princeton, New Jersey

M.E. Greenberg, Harvard Medical School, Boston, Massachusetts: Neurotrophin regulation of gene expression during cell growth and differentiation.
H. Nawa, Cold Spring Harbor Laboratory, New York: Regulation of neuropeptide expression by BDNF.
T. Pawson, Mt. Sinai Hospital, Toronto, Ontario, Canada:

SH2 and SH3 domains in signal transduction.
J. Schlessinger, New York University Medical Center, New York: Signal transduction by receptors that regulate tyrosine phosphorylation.
S. Green, University of Iowa, Iowa City: Convergence and specificity in intracellular signaling in PC12 cells.



M. E. Hatten, M. Greenberg

SESSION 6: Mechanisms of Neuronal Death

Chairperson: R. McKay, Massachusetts Institute of Technology, Cambridge

D. Hockenbery, Fred Hutchinson Cancer Research Center, Seattle, Washington: Regulation of cell death and the action of *bcl-2*.

S. Estus, Washington University Medical School, St. Louis, Missouri: Studies of gene expression in neurons undergoing programmed cell death.

E.W. Rubel, University of Washington, Seattle: Afferent

regulation of neuronal life and death: Plasticity of cytoplasmic organelles.

M.A. Bothwell, University of Washington, Seattle: Ribosome structural changes: An early event in neuronal cell death.

R. McKay, Massachusetts Institute of Technology, Cambridge: Concluding remarks.

Workshop on Human Genetics and Genome Analysis

December 6–December 9

FUNDED BY

Office of Health and Environmental Research, U.S. Department of Energy

ARRANGED BY

M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York

D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory, New York

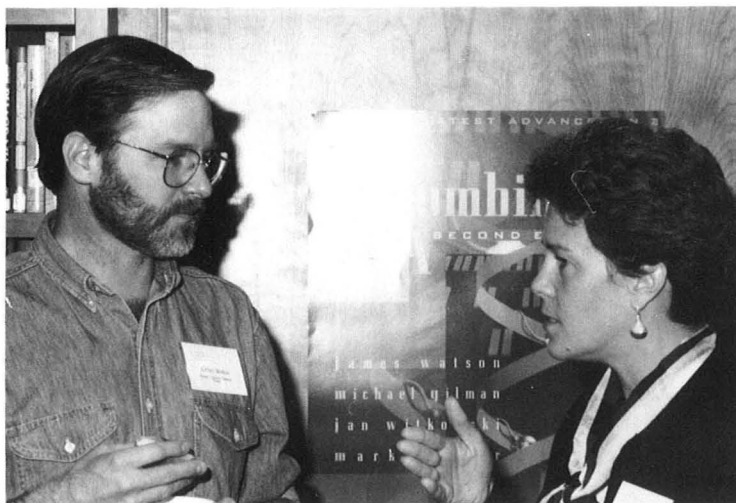
J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York

SESSION 1

D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Mendelian view of the gene.

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York: Modern view of the gene.

N. Press, University of California, Los Angeles, Medical Center: Population screening for genetic diseases.



J. Botkin, P. Ward

SESSION 2

D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory: Using restriction enzymes and constructing chromosome maps.

SESSION 3

M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Cloning genes.

J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York: DNA diagnosis of human genetic diseases.

P. Ward, Baylor College of Medicine, Houston, Texas: Counseling for human genetic diseases.

SESSION 4

M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory: Human DNA fingerprinting by polymerase chain reaction.

D. Micklos, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory: Inserting DNA into bacteria and making gene libraries.

SESSION 5

D. Micklos and M. Bloom, DNA Learning Center, Cold Spring Harbor Laboratory, New York: Laboratory Results: Inserting DNA into bacteria and human DNA fingerprinting.

K. Culver, National Institutes of Health, Bethesda, Maryland: The first human gene therapy trials.

SESSION 6

R. Davis, Cold Spring Harbor Laboratory, New York: Searching for the genetic basis of learning and memory.



J. Forehand, V. Logan, M. Bloom

DNA Forensic Fingerprinting

December 13–December 15

FUNDED IN PART BY

New York State Division of Criminal Justice Services

ARRANGED BY

J. Ballantyne, Suffolk County Crime Laboratory, Hauppauge, New York

T. Marr, Cold Spring Harbor Laboratory, New York

P.F. Palmedo, Long Island Research Institute, Setauket, New York

SESSION 1: Overview of Policies and Strategies

Chairperson: V. Crispino, Suffolk County Crime Laboratory, Hauppauge, New York

J.W. Hicks, Federal Bureau of Investigation Laboratory,
Washington, D.C.: Federal and national systems.

R. Girgenti, New York State Division of Criminal Justice Ser-
vices, Albany: New York State.

SESSION 2: Review of Current Systems

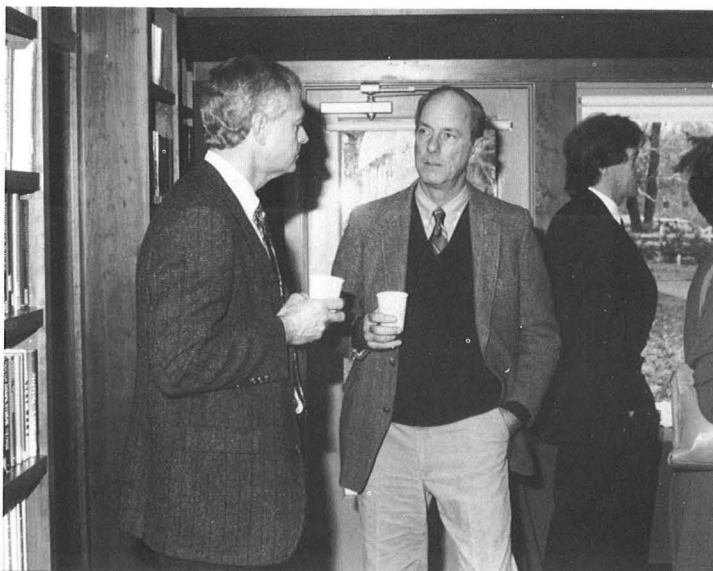
Chairperson: V. Crispino, Suffolk County Crime Laboratory, Hauppauge, New York

J.R. Brown, Federal Bureau of Investigation Laboratory,
Washington, D.C.: The FBI system.

J.D. Ban, Virginia Division of Forensic Sciences, Richmond,
Virginia: The State of Virginia.

D. Coffman, Florida Department of Law Enforcement, Tal-
lahassee: The State of Florida.

F.C. Dolejsi, Minnesota Department of Public Safety, St.
Paul: The State of Minnesota.



J. Hicks, P.F. Palmedo

SESSION 3: Review of New York State Laboratories

Chairperson: R. Girgenti, New York State Division of Criminal Justice Services, Albany

R. Horn, New York State Police Crime Laboratory, Albany

B. Duceman, New York State Police Crime Laboratory, Albany

J. Ballantyne, Suffolk County Crime Laboratory, Hauppauge, New York

J.P. Simich, Erie County Central Police Services, Buffalo, New York

S. Wanlass, Nassau County Police Department, Mineola, New York

L. Duffy, Westchester County Department of Laboratories and Research, Valhalla, New York

SESSION 4: Developments in Computer Databases

Chairperson: K.L. Monson, FBI Academy, Quantico, Virginia

T.G. Marr, Cold Spring Harbor Laboratory, New York: New database technologies.

M. Cinkosky, Los Alamos National Laboratory, New Mexico: Ten year's experience with running an international genetics database.

S.T. Smith, Los Alamos National Laboratory, New Mexico: Comments on computer security.

SESSION 5: Presentation and Discussion of Pilot Project

Discussion Leader: T.G. Marr, Cold Spring Harbor Laboratory, New York



T. Marr, K. Monson

BANBURY CENTER

<i>Grantor</i>	<i>Program/Principal Investigator</i>	<i>Duration of Grant</i>	<i>Total Award</i>
FEDERAL GRANTS			
DEPARTMENT OF ENERGY			
	Human Genetics and Genome Analysis: Practical Workshop for Public Policy Makers and Opinion Leaders	3/91 -3/93	128,059
	DNA Repeats and Human Gene Mutations	9/92 -9/93	15,000 *
NONFEDERAL SUPPORT			
<i>Meeting Support</i>			
Abbott Laboratories	Constructing Organisms	1992	1,000 *
Abbott Laboratories	Lyme Disease Symposium	1993	5,000 *
Allen & Hanburys (Glaxo, Inc.)	Lyme Disease Symposium	1993	10,000 *
The Charles A. Dana Foundation	Decade of the Brain	1992	27,200 *
Dr. Amy and James Elster Research Fund	Marfan Meeting	1991	2,000 *
Hoffmann-La Roche Inc.	Control of HIV Expression	1992	2,000 *
Pfizer Inc.	Lyme Disease Symposium	1993	10,000 *
Merck Research Laboratories	Control of HIV Expression	1992	4,000 *
RepliGen Corporation	Constructing Organisms	1992	5,000 *
RepliGen Corporation	Control of HIV Expression	1992	5,000 *
Sandoz Corporation	Marfan Meeting	1991	2,500 *
Alfred P. Sloan Foundation	Journalists and Congressional Workshops	1990 -1992	150,000
The Wellcome Trust	Constructing Organisms	1992	19,579 *
The William Stamps Farish Fund	Meetings on Complex Genetic Diseases	1991 -1993	150,000

* New Grants Awarded in 1992

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Andrew Sauer, Buildings and Grounds

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