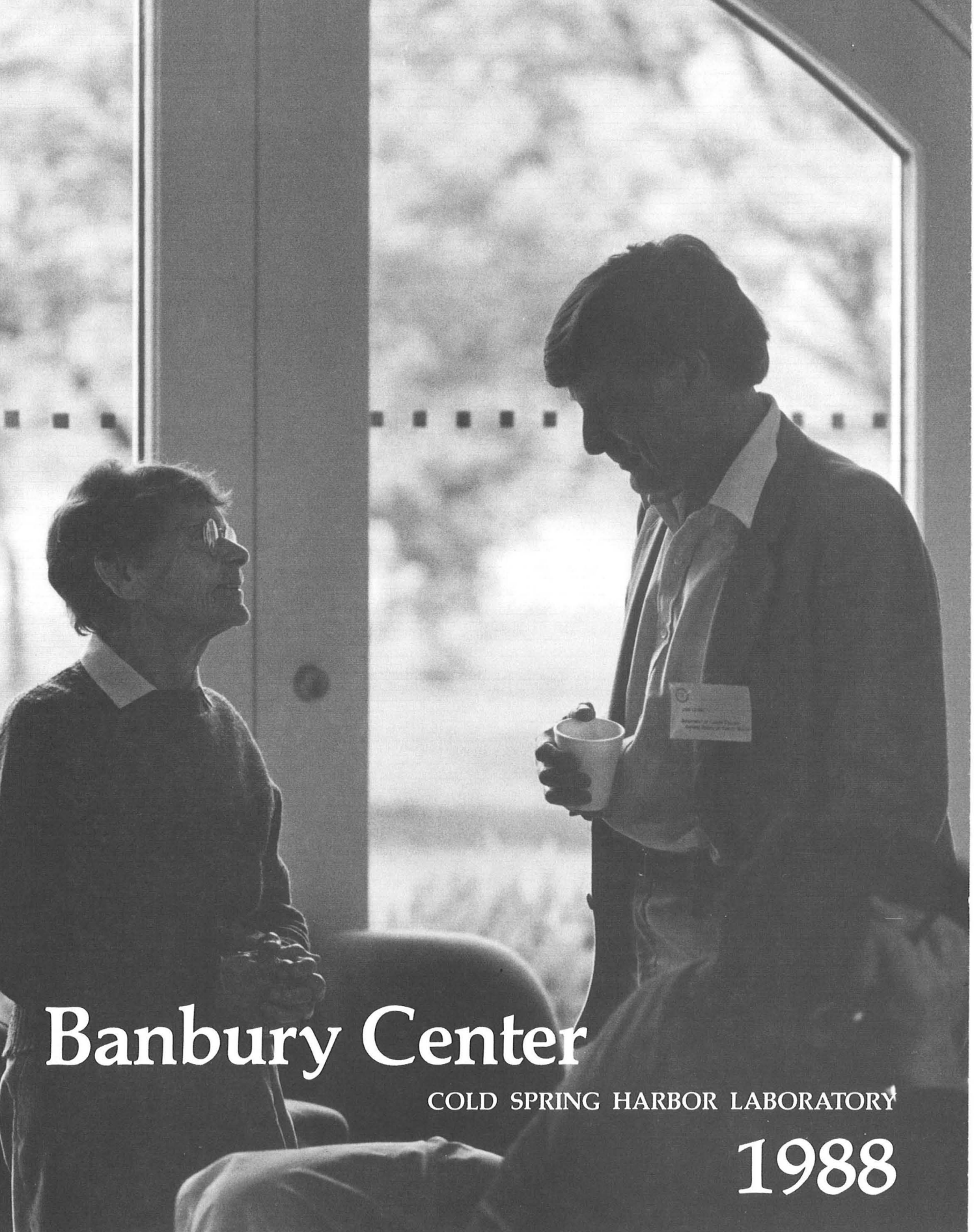


Banbury Center

COLD SPRING HARBOR LABORATORY

1988

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 environmental and occupational risk assessment, and molecular biology and genetics, especially as they bear on health, social, and policy issues.

Banbury conferences, kept small to maximize spontaneous 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 and publication offices, a small library, and—at its center—an opulently appointed yet intimate and informal conference room. Replete 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 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.

(Above) Architectural drawing of 1979 design of Sammis Hall, completed, with modifications, in 1981.
(Cover) Drs. Barbara McClintock and John Cairns during informal discussions at a Banbury Center meeting.
Mailing address: Banbury Center, P.O. Box 534, Cold Spring Harbor, New York 11724

BANBURY CENTER DIRECTOR'S REPORT

Sixteen meetings, with over 500 participants, were held at the Banbury Center in 1988. The topics reflect the increasing diversity of Banbury Center meetings, with subjects drawn from research in "basic" science, biotechnology, human diseases, and the neurosciences.

HIV and AIDS

Discussions of AIDS featured strongly during the year. Research on the human immunodeficiency virus (HIV), the causative agent of AIDS, has shown that complex interactions between virus and host-cell factors govern expression of HIV genes. Controversial data have been accumulating about these interactions, and the **Control of HIV Gene Expression** meeting was one of the highlights of the Banbury year. Needless to say, the meeting did not resolve all of the issues, but at least the relevant parties met and an attempt was made to untangle the confusion of the names of the HIV genes. This came to fruition later in the year with the publication in *Nature* of a proposal for a standardized nomenclature.

Molecular Genetics and Human Inherited Diseases

Two meetings dealt with the molecular biology and genetics of human disorders. The **Genetic Approaches in Schizophrenia** meeting was particularly exciting as it brought together expert geneticists and psychiatrists who have been studying the genetics of schizophrenia. The aim of the meeting was to determine if the armamentarium of molecular genetics that has been applied so successfully in other human inherited disorders can be applied to schizophrenia. However, it became clear during the course of the meeting that so little is known about the underlying biology of schizophrenia, and its definitive diagnosis is so difficult, that more patient and family studies are required.

The **Molecular Biology of Alzheimer's Disease** meeting showed that research on this disease is at a more satisfactory stage. This meeting included a remarkable group of studies ranging from neuroanatomical genetics, through protein chemistry, to molecular genetics. In a particularly exciting session, it was shown that β-amyloid protein is not a constituent of the paired helical filaments that accumulate in the tangles and plaques that are characteristic of Alzheimer's disease. In addition to evaluating data, meeting participants discussed the ethics of performing early autopsies to obtain brain samples from patients. The overwhelming consensus of the participants was that these procedures are ethical and provide invaluable data.

Technical Developments in Molecular Biology

The Banbury Center is noted for meetings dealing with the technical aspects of molecular biology, and another meeting in the **Viral Vectors** "series" was held in March. Not suprisingly, the topic of retroviruses as vectors dominated the meeting, but there were presentations dealing with small DNA viruses such as bovine papillomavirus and vectors for expression such as the insect baculoviruses.

During the past two years, a new technique called the polymerase chain reaction (PCR) has been sweeping through molecular biology laboratories. The technique enables very large quantities of specific DNA sequences to be generated from very small starting amounts of DNA. Perkin-Elmer Cetus sponsored the **Polymerase Chain Reaction** meeting, which brought a group of the world's leading exponents of the technique to the Banbury Center to discuss the latest, novel uses of the technique. PCR applications are very diverse and it became clear during the meeting that they are limited only by the ingenuity of the research scientist!

Another meeting dealing with the molecular biology techniques was that on **DNA Technology and Forensic Science**. Participants included forensic scientists, population geneticists, representatives of law enforcement agencies, prosecution and defense attorneys, ethicists, and civil libertarians. There were many energetic exchanges on the whole range of problems inherent in the introduction of DNA evidence into the legal system. The meeting set out these issues in a clear and forthright way for further debate in the legal and forensic communities.

Linkage analysis using restriction-fragment-length polymorphisms (RFLPs) has revolutionized human genetics, and the meeting on **Molecular Markers and Their Application to Problems in Plant Genetics** showed that RFLPs are likely to have a similar impact in plant genetics. Detailed RFLP maps are being prepared for a number of agriculturally important crops, and RFLPs linked with quantitative trait loci should improve the efficiency of breeding programs.

Topics in Basic Research

Ubiquitin is a small, highly conserved protein that, as its name implies, seems to take part in many processes in the cell. **The Ubiquitin System** was the subject of a meeting in Spring 1988, at which the molecular genetics of ubiquitin and its structure were discussed, as well as its role in protein degradation.

One of the most popular meetings of the year was **Cell Cycle Control in Eukaryotes**. An interesting feature of this meeting was the wide range of organisms that has been selected for study of cell-cycle control. The techniques of modern molecular biology provide tools for getting to the basic features of cell-cycle control, for example, by selecting genes that are activated or proteins that are synthesized when cells are stimulated to enter mitosis.

Sloan Foundation Workshops

The Workshops for science journalists and Congressional staff workers continue to be very successful in introducing the two groups to important scientific issues. The **AIDS Update** for the Congressional staff was, not surprisingly, very popular. The speakers included the leading people in the field, covering the molecular biology of the human immunodeficiency virus, epidemiology, and drug treatments. One of the highlights of the meeting was a discussion of the social impact of AIDS.

The continuing interest of the Press in molecular biology, especially in relation to human health, was evident from the 20 journalists who came to the workshop on the **Impact of DNA Technology in Medicine** in March. The topics of the meeting included DNA diagnosis, gene therapy, and AIDS. At least three of the journalists wrote stories using the meeting as background, including a front-page story in the *Wall Street Journal.*

The Baring Brothers/CSHL Conference

For the third year, the Banbury Center was host to a meeting for senior business executives, this year organized in conjunction with Baring Brothers. The meeting attracted a record number of participants, including executives from companies in our Corporate Sponsor Program. The subject was **Manipulating the Immune Response**. Once again an outstanding group of scientists came, and they covered such topics as cytokines, catalytic antibodies, and *scid* mice for analysis of immune function. One afternoon was spent in the DNA Learning Center, where a group of industry's leaders enthusiasically tackled an experiment.

Other Meetings

We have continued to make the Center available to other groups when appropriate. The deans of the Associated Medical Schools of New York came for a study

weekend, reviewing once more the problems they face operating in a city like New York. In April, the Klingenstein Fund held a review of the neuroscience research supported by the Fund. In May, the Cold Spring Harbor School District brought parent leaders to the Banbury Center to discuss AIDS education. This fascinating meeting provided a perspective on AIDS that was very different from perspectives provided by the technical meeting on HIV gene expression. Here, a small community was trying to come to grips with the complex and diverse responses of society to this disease. We have also continued to host seminars for the local community of Lloyd Harbor. These are presentations by members of nonprofit organizations in the village. The 1988–1989 meetings season began in October, when I spoke on genes and cancer, and in December, Don Nilson of Friends World College spoke on differences between American and Japanese cultures.

Funding

The Corporate Sponsor Program once again underpinned the meetings program, providing funding for five meetings, and support for the meeting on **Cytoskeletal Proteins in Tumor Diagnosis** came from the James McDonnell Foundation. In addition, companies and federal sources provided $120,000 in contributions for the support of other meetings. Particularly noteworthy was the meeting on **Polymerase Chain Reaction**, sponsored entirely by Perkin-Elmer Cetus. A number of companies, including five Japanese companies, underwrote the costs of another very successful **Therapeutic Peptides** meeting. As a result, we were very pleased to welcome a larger than usual number of Japanese scientists to the meeting. This proved to be one of the special features of this meeting, and I hope that we will be able to increase Japanese participation in other meetings. However, this cannot be done without support because of the high costs of travel between Japan and the United States.

A number of plant biotechnology companies contributed to the cost of the plant molecular markers meeting, and many of these companies have expressed an interest in supporting a similar meeting in 1989. Five biotechnology companies helped to underwrite the meeting on the **Control of Gene Expression in HIV**, and the success of the meeting was instrumental in obtaining a contract from the National Institute for Allergic and Infectious Diseases to hold two meetings on HIV/AIDS in 1989. I hope that this will be extended for a three-year period. Three companies applying "DNA fingerprinting," together with one of the National Institutes, contributed to the **DNA Technology and Forensic Science** meeting. Unusually for Cold Spring Harbor Laboratory, this was *not* one of the National Institutes of Health, but the National Institute of Justice!

Full details of support for Banbury Center meetings are listed under "Grants and Contributions." I am very encouraged by the positive responses of companies to requests for support for meetings, although my goal is to try to obtain some longer-term funding for meetings in specific areas. These responses show that we are holding meetings that deal with exciting scientific research and that also have wider implications for society.

Funding for Congressional and Science Journalist Workshops

The Sloan Foundation began to support the Banbury Center program as long ago as August 1978. That the Foundation has given us funding for ten consecutive years is an indication of the success and importance of this workshop series. The present grant will fund two further meetings to be held in 1989, but I am very pleased to report that the Sloan Foundation has approved a further three years of funding for this program. One feature that we are going to introduce into the next series of meetings is a laboratory session at the DNA Learning Center. We hope that doing even a simple experiment using restriction endonucleases and running gels will give the participants a better appreciation of molecular biology research.

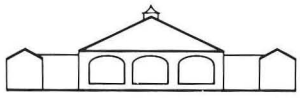
Banbury Center Publications

These publications are now the responsibility of Cold Spring Harbor Laboratory Press, but I want to mention that a more flexible policy regarding the style of books has been implemented and their publication has been speeded up. Meetings may be published in the **Current Communications in Molecular Biology**

series, the **Banbury Report** series, or as individual volumes. The **Control of Gene Expression in HIV** meeting was the first to be published as a special volume, and it appeared within five months of the meeting. We expect the books based on the **Polymerase Chain Reaction** and the **DNA Technology and Forensic Science** meetings to be firsts in their fields.

The Banbury Center Logo

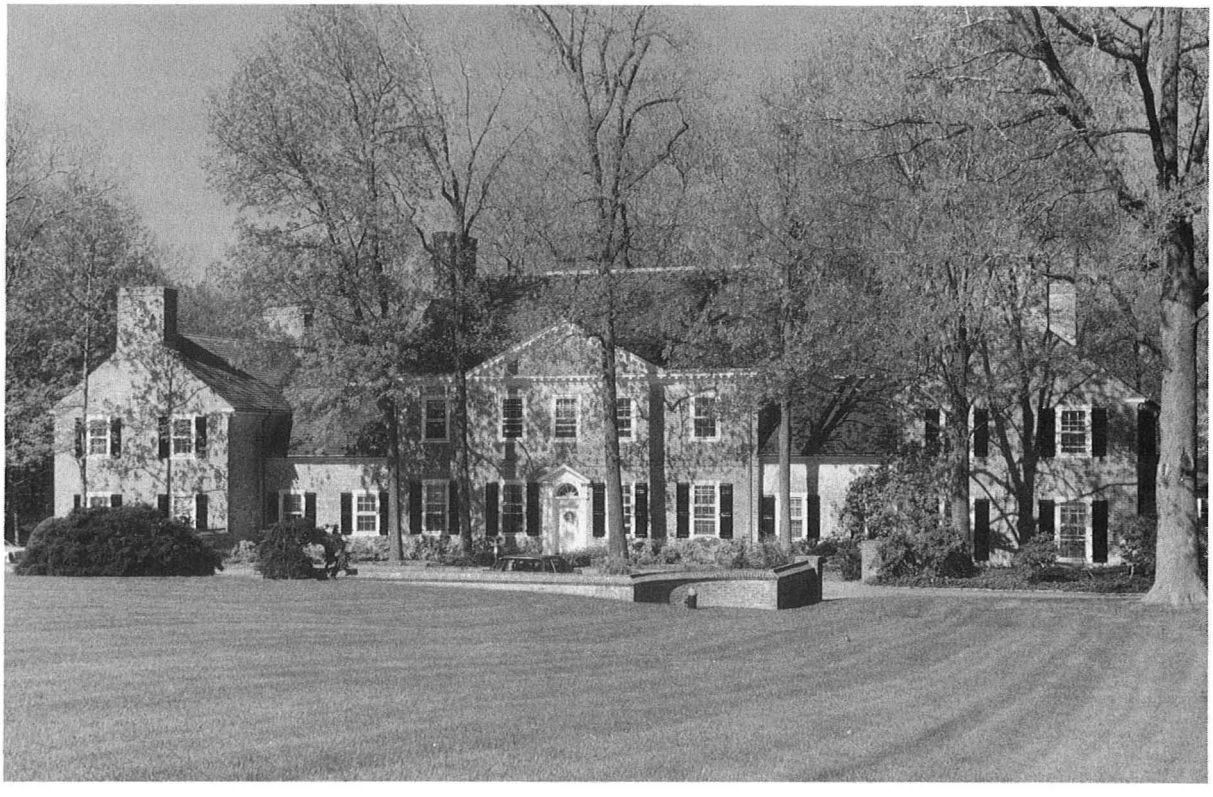
To make the activities of the Center known more widely, we have designed a logo, a stylized view of the Conference Center, that will appear on the title page of our publications.



Looking Forward to 1989

I remarked in last year's Annual Report that the Banbury Center program would become more diverse and deal with an increasing number of topics in the areas of biotechnology, human diseases, and the social impact of modern biology. This change in emphasis was evident in the 1988 program and will continue in 1989. There will be meetings dealing with "basic" research (recessive oncogenes; early development in *Drosophila* and mouse; molecular biology and evolution), environmental issues (germ-line mutations), biotechnology (genetic engineering of livestock), and social issues (alcoholism; scientific misconduct).

Robertson House provides housing and dining accommodations at Banbury Center



Conclusion

I have been at the Banbury Center for just over one year, and I am finding it to be as enjoyable and fascinating as I had expected. I was enthusiastic about the aims of the Banbury Center before I arrived, and my experience with the variety of topics and the enthusiasm of participants demonstrates that the Banbury Center is a unique resource for exchanging scientific information. Bea Toliver, the Center's administrative assistant, together with Barbara Fischer and Eleanor Sidorenko, and Katya Davey at Robertson House, worked hard, often under considerable pressure, to ensure that our program was implemented smoothly. All the indications are that 1989 at the Banbury Center will be as successful, exciting, and innovative as 1988.

Publications

Caskey, C.T., R.A. Gibbs, J.A. Witkowski, and J.F. Hejtmancik. 1988. Diagnosis of human inheritable defects by recombinant DNA. *Phil. Trans. R. Soc. B* **319:** 353–360.

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), pp. 83–100. Alan R. Liss Inc., New York.

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. 1989. Complementary cDNA probes for the Duchenne muscular dystrophy locus demonstrate a previously undetectable deletion in a patient with dystrophic myopathy, glycerol kinase deficiency and congenital adrenal hypoplasia. *J. Clin. Invest.* (in press).

Ward, P.A., J.F. Hejtmancik, J.A. Witkowski, L. Baumbach, S. Gunnel, J. Speer, P. Hawley, U. Tantravahi, C.T. Caskey, and S. Latt. 1989. Prenatal diagnosis of Duchenne muscular dystrophy: Prospective linkage analysis and retrospective dystrophin cDNA analysis. *Am. J. Hum. Genet.* (in press).

Witkowski, J.A. 1988. The molecular genetics of Duchenne muscular dystrophy: The beginning of the end? *Trends Genet.* **4:** 27–30.

Witkowski, J.A. 1988. The discovery of "split" genes: A scientific revolution. *Trends Biochem. Sci.* **13:** 110–113.

Witkowski, J.A. 1988. Fifty years on molecular biology's hall of fame. *Trends Biotechnol.* **6:** 234–243.

Witkowski, J.A. 1989. 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. 1989. Milestones in the development of DNA technology. In *DNA: From the crime lab. to the courtroom.* American Chemical Society. (In press.)

Witkowski, J.A. 1989. Dystrophin and Duchenne muscular dystrophy. *J. Child Neurol.* (in press).

Witkowski, J.A. and C.T. Caskey. 1988. Duchenne muscular dystrophy—DNA diagnosis in practice. *Curr. Neurol.* **8:** 1–36.

MEETINGS

Congressional Workshop on AIDS

January 28–January 30

ARRANGED BY

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

SESSION 1

J.D. Watson, Cold Spring Harbor Laboratory, New York: Introduction.
I. Chen, University of California, Los Angeles: Molecular biology of HIV.
H. Jaffe, Centers for Disease Control, Atlanta, Georgia: Epidemiology of AIDS.
A. Stanley, Los Alamos National Laboratory, New Mexico: The future of the AIDS epidemic—Computer modeling.

SESSION 2

G.B. Scott, University of Miami School of Medicine, Florida: Pediatric aspects of HIV infections.
S. Broder, National Cancer Institute, Bethesda, Maryland: Combating HIV. I. Drug therapy.
J. Petricciani, U.S. Public Health Service, Washington, D.C.: Combating HIV. II. Vaccines.

SESSION 3

R. Stall, Rutgers University, New Brunswick, New Jersey: Combating HIV. III. Education and behavior.
M. F. Silverman, American Foundation for Research on AIDS, Los Angeles, California: Social aspects of the AIDS epidemic.

The Control of HIV Gene Expression

February 28–March 2

ARRANGED BY

R. Franza, Cold Spring Harbor Laboratory, New York
B.R. Cullen, Duke University Medical Center, Durham, North Carolina
F. Wong-Staal, National Cancer Institute, Bethesda, Maryland

SESSION 1: HIV *TRANS*-ACTING ELEMENTS

F. Wong-Staal, National Cancer Institute, Bethesda, Maryland: Mutagenesis of the *tat* and *trs* genes of an infectious HIV genome.

G.N. Pavlakis, NCI-Frederick Cancer Research Facility, Maryland: HIV regulation by viral *trans*-activators.

C.A. Rosen, Roche Institute of Molecular Biology, Nutley, New Jersey: Regulation of HIV gene expression by the *art* protein.

S. Venkatesan, National Institutes of Health, Rockville, Maryland: Properties of *tat* and 3′ *orf* mutants of HIV.

D. Capon, Genentech, Inc., South San Francisco, California: Regulation of HIV gene expression by the HIV-1 *tat* gene product.

B.R. Cullen, Duke University Medical Center, Durham, North Carolina: HIV *tat* gene function.

B.M. Peterlin, University of California, San Francisco: HIV-1 activation and *trans*-activation by the *tat* gene product.

A.P. Rice, Cold Spring Harbor Laboratory, New York: The use of adenovirus vectors to analyze HIV gene expression.

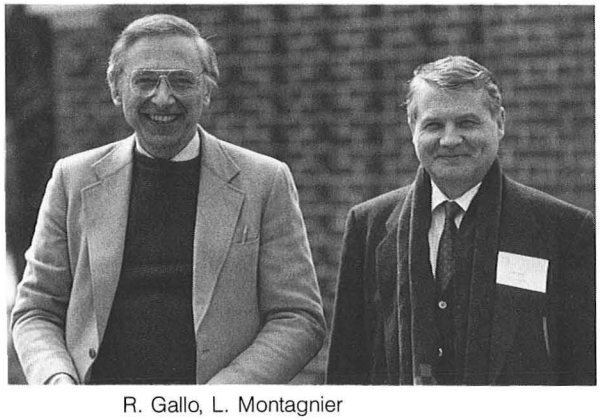
M. Rosenberg, Smith Kline & French Laboratories, King of Prussia, Pennsylvania: HIV *trans*-activation phenomenon and protease function.

E. Holland, Stanford University School of Medicine, California: Mutations in the *tar* region of HIV-1.

L. Montagnier, Institut Pasteur, Paris, France: Diversity and gene function of the human immunodeficiency viruses.

M. Emerman, Institut Pasteur, Paris, France: HIV-2 *tat*.

W. Haseltine, Dana-Farber Cancer Institute, Cambridge, Massachusetts: Regulation of replication of HIV-1.

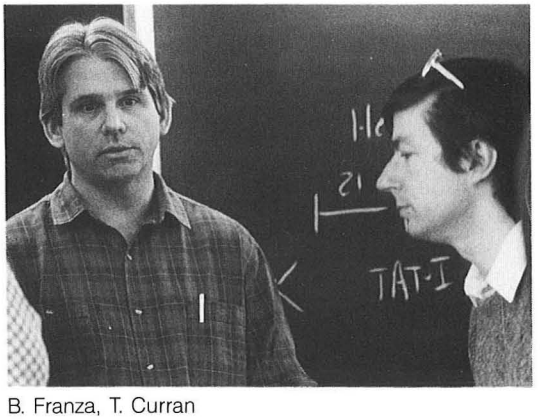


R. Gallo, L. Montagnier

J. Brady

J. Clements

G. Pavlakis, B. Felber



B. Franza, T. Curran

SESSION 2: CELLULAR FACTORS INVOLVED IN RETROVIRAL GENE EXPRESSION

P.A. Baeuerle, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts: Activation of NF-κB.

R. Franza, Cold Spring Harbor Laboratory, New York: Study of cellular proteins that interact with the HIV long terminal repeat.

T. Curran, Roche Institute of Molecular Biology, Nutley, New Jersey: *fos* and gene regulation.

W.C. Greene, Duke University Medical Center, Durham, North Carolina: HIV-1 and T-cell activation.

K.A. Jones, Salk Institute, San Diego, California: Analysis of the cellular transcription complex at the HIV promoters.

M.A. Norcross, U.S. Food and Drug Administration, Bethesda, Maryland: Characterization of HIV-1 enhancer-binding proteins.

R.G. Roeder, Rockefeller University, New York: Eukaryotic transcription factors and mechanisms.

J. Kadonaga, University of California, Berkeley: Promoter-selective activation of transcription by Sp1.

H.E. Varmus, University of California, San Francisco: Signals for the expression of the HIV *pol* gene by ribosomal frameshifting.

J.D. Mosca, Johns Hopkins Oncology Center, Baltimore, Maryland: Herpesvirus *trans*-activation—Role of HIV-1 *tat* in RNA stability.

SESSION 3: REGULATION OF GENE EXPRESSION IN RELATED RETROVIRUSES

I.S.Y. Chen, University of California, Los Angeles: Pathogenesis of HTLV/HIV.

J. Brady, National Institutes of Health, Bethesda, Maryland: HTLV-I gene regulation.

B. Felber, NCI-Frederick Cancer Research Facility, Maryland: Regulation of viral and cellular promoters by the transcriptional activator of HTLV-I.

J.E. Clements, Johns Hopkins Hospital, Baltimore, Maryland: *trans*-Activation of visna virus—A neurotropic lentivirus of sheep.

F. Wong-Staal, National Cancer Institute, Bethesda, Maryland: Meeting summary.

Journalists' Workshop on "The Impact of DNA Technology in Medicine"

March 6–March 8

ARRANGED BY

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

SESSION 1: THE "NEW" GENETICS

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

P. Ward, Institute for Molecular Genetics, Baylor College of Medicine, Houston, Texas: Duchenne muscular dystrophy—DNA diagnosis in practice.

J. Gitschier, Howard Hughes Medical Institute, University of California, San Francisco: Hemophilia—State-of-the-art DNA diagnosis.

M. Furth, Oncogene Science Inc., Manhasset, New York: Cancer diagnosis.

SESSION 2: GENE THERAPY AND DNA DIAGNOSIS

F. Ledley, Howard Hughes Medical Institute, Baylor College of Medicine, Houston, Texas: Gene therapy—Reality and future promise.

J. Sninsky, Cetus Corporation, Emeryville, California: DNA probes in the diagnosis of acquired diseases.

D.J. Green, Cellmark Diagnostics, Germantown, Maryland: DNA "fingerprinting"—What it is and what it does.

SESSION 3: SOCIAL AND ETHICAL CONSEQUENCES

R. Myers, Boston University Medical Center, Massachusetts: DNA diagnosis in Huntington's chorea.

L. Andrews, American Bar Foundation, Chicago, Illinois: Genetic testing—Protecting the individual.

Viral Vectors

March 13–March 16

ARRANGED BY

Y. Gluzman, Lederle Laboratories, Pearl River, New York
S.H. Hughes, NCI-Frederick Cancer Research Facility, Maryland

SESSION 1

B. Moss, National Institutes of Health, Bethesda, Maryland: Vaccinia virus and vaccinia virus/baceriophage T7 hybrid vectors.

B. Roizman, University of Chicago, Illinois: Genetic engineering of herpes simplex viruses for use as vaccines and vectors.

L. Post, Upjohn Company, Kalamazoo, Michigan: Pseudorabies virus—A possible vector for vaccines in livestock animals.

E.S. Mocarski, Stanford University School of Medicine, California: Recombinant cytomegalovirus-based expression vectors.

B. Mason, Wyeth Laboratories, Inc., Philadelphia, Pennsylvania: Recombinant adenovirus as a vaccine.

K.L. Berkner, ZymoGenetics, Seattle, Washington: Efficiency of translation of polycistronic messages in uninfected and adenovirus-infected cells.

SESSION 2

E.A. Dzierzak, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts: In vivo expression of a normal cellular human β-globin gene transduced via retroviral infection of murine bone marrow.

E. Gilboa, Memorial Sloan-Kettering Cancer Center, New York, New York: Retroviral gene transfer—Applications to human therapy.

A.D. Miller, Fred Hutchinson Cancer Research Center, Seattle, Washington: Retrovirus-mediated gene transfer into skin fibroblasts.

J. Ellis, Mt. Sinai Hospital Research Institute, Toronto, Canada: Gene targeting with retroviral vectors.

R. Cone, Cold Spring Harbor Laboratory, New York: Establishment of differentiated cell lines using retroviral vectors.

SESSION 3

D. DiMaio, Yale University School of Medicine, New Haven, Connecticut: Bovine papilloma genetics—Implications for vector design.

S. Goodbourn, Imperial Cancer Research Fund Laboratories, London, England: Use of a bovine papillomavirus vector to study gene expression.

W. Hammerschmidt, McArdle Laboratory for Cancer Research, Madison, Wisconsin: Viral vectors derived from Epstein-Barr virus.

R.F. Margolskee, Roche Institute of Molecular Biology,

Nutley, New Jersey: Epstein-Barr virus shuttle vectors for stable episomal replication of cDNA expression libraries in human cells.

M. Manos, Cetus Corporation, Emeryville, California: Use of an SV40/adenovirus recombinant in an inducible mammalian expression system.

R. Kaufman, Genetics Institute, Cambridge, Massachusetts: The role of eIF-2 α phosphorylation in translational control in transfected and adenovirus-infected cells.

N. Muzyczka, State University of New York, Stony Brook: The genetics of adeno-associated virus.

SESSION 4

S.H. Hughes, NCI-Frederick Cancer Research Facility, Maryland: Retroviral vectors and adaptors.

J.M. Coffin, Tufts University School of Medicine, Boston, Massachusetts: Effect of antisense RNA on retrovirus replication.

M. Linial, Fred Hutchinson Cancer Research Center, Seattle, Washington: Retrofection—Reverse transcription and integration of nonretroviral RNAs after viral infection.

R. Dornburg, University of Wisconsin, Madison: A retroviral vector system to study the formation of cDNA genes.

A.J. Kingsman, University of Oxford, England: Exploitation of a retrotransposon to produce polyvalent particulate proteins.

H. Piwnica-Worms, Dana-Farber Cancer Institute, Boston, Massachusetts: Interactions between $pp^{60c\text{-}srs}$ and the middle T antigen of polyomavirus in insect cells.

SESSION 5

P. Ahlquist, University of Wisconsin, Madison: Plant RNA virus gene expression vectors.

D.M. Bisaro, Ohio State University, Columbus: Genetic analysis of tomato golden mosaic virus.

J. Futterer, Friedrich-Miescher-Institut, Basel, Switzerland: Transient expression from CaMV signals in plant protoplasts.

S. Schlesinger, Washington University School of Medicine, St. Louis, Missouri: Development of Sindbis virus and defective-interfering RNAs as expression vectors.

M.D. Summers, Texas A&M University, College Station: Baculovirus-directed foreign gene expression.

N.C. Jones, Imperial Cancer Research Fund Laboratories, London, England: Overproduction of E1A, human EGF receptor, and protein kinase proteins in the baculovirus expression system—Functional characterization of purified proteins.

Cell Cycle Control in Eukaryotes

March 20–March 23

ARRANGED BY

D. Beach, Cold Spring Harbor Laboratory, New York
C. Basilico, New York University Medical Center, New York
J. Newport, University of California, San Diego, La Jolla

SESSION 1

S. Reed, Research Institute of Scripps Clinic, La Jolla, California: Control of cell division in *S. cerevisiae*.

F. Cross, Fred Hutchinson Cancer Research Center, Seattle, Washington: Size control in *S. cerevisiae*.

K. Matsumoto, DNA Research Institute, Palo Alto, California: Cell cycle control within the G_1 phase of *S. cerevisiae*.

C. Basilico, New York University Medical Center, New York: Cloning of cell cycle genes.

N. Heintz, Rockefeller University, New York, New York: Factors controlling histone gene expression during the cell cycle.

J. Roberts, Fred Hutchinson Cancer Research Center, Seattle, Washington: Regulation of DNA replication.

T. Roberts, Dana-Farber Cancer Institute, Boston, Massachusetts: Oncogenes and signal transduction.

SESSION 2

H.L. Ozer, Hunter College, CUNY, New York, New York: Studies with mammalian cell mutants temperature-sensitive for cell and viral DNA synthesis.

B. Stillman, Cold Spring Harbor Laboratory, New York: Cellular proteins required for multiple stages of DNA replication.

W. Earnshaw, Johns Hopkins University School of Medicine, Baltimore, Maryland: Synthesis, stability, and modification of DNA topoisomerase II across the eukaryotic cell cycle.

R. Laskey, CRC Molecular Embryology Group, Cambridge, England: Control of DNA replication in *Xenopus* egg extracts.

D.M. Glover, Imperial College of Science and Technology, London, England: Mitosis in *Drosophila*.

P. O'Farrell, University of California, San Francisco: Programming spatial patterns of gene expression and cell division times in early *Drosophila* embryos.

T. Nishimoto, Kyushu University, Maidashi, Fukuoka, Japan: Identification of human RCCI protein and the possible involvement of ubiquitin for onset of chromosome condensation.

SESSION 3

D. Beach, Cold Spring Harbor Laboratory, New York: Control of mitosis by the *cdc2* protein kinase in fission yeast and human cells.

N.R. Morris, UMDNJ-Robert Wood Johnson Medical School, Piscataway, New Jersey: Regulation of mitosis in *Aspergillus nidulans*.

L.H. Hartwell, University of Washington, Seattle: *RAD9* controls the G_2 transition in *S. cerevisiae*.

T. Hunt, University of Cambridge, England: Role of cyclin synthesis and destruction in meiotic and mitotic cell cycles in eggs and oocytes.

J. Ruderman, Duke University, Durham, North Carolina: Mitotic cyclins and the cell cycle in early embryos.

W. Dunphy, University of California, San Diego: A yeast *cdc* gene product regulates mitotic conversion in *Xenopus* egg extracts.

J.L. Maller, University of Colorado School of Medicine, Denver: Purification and characterization of maturation-promoting factor from *Xenopus* eggs.

D. Chelsky, E.I. duPont de Nemours & Company, Wilmington, Delaware: Lamin B methylation and assembly.

Session 4

J.S. Hyams, University College, London, England: The fission yeast cytoskeleton and cell-cycle control.

B. Byers, University of Washington, Seattle: Regulation of the spindle pole body in budding yeast.

M. Yanagida, Kyoto University, Japan: Genetic control of mitotic anaphase—Association and dissociation of sister chromatids in cell cycle.

W.Z. Cande, University of California, Berkeley, California: Regulation of anaphase spindle elongation in vitro.

D. Vandre, Southern Methodist University, Dallas, Texas: Phosphorylation state of microtubule organizing centers—Regulation of activity during mitosis.

K. Hennessy, Massachusetts Institute of Technology, Cambridge, Massachusetts: Characterization of new cell cycle mutants.

S. Jentsch, Massachusetts Institute of Technology, Cambridge, Massachusetts: Ubiquitin-ligation system of *S. cerevisiae*.

C.D. Stiles, Dana-Farber Cancer Institute, Boston, Massachusetts: The role of PDGF-inducible genes in the mitogenic response of fibroblast cells.

D. Nathans, Johns Hopkins University School of Medicine, Baltimore, Maryland: The genomic response to growth factors.

R. Franza, Cold Spring Harbor Laboratory, New York: Fos complex interacts with control elements that contain an AP1 site.

R. Bravo, European Molecular Biology Laboratory, Heidelberg, Federal Republic of Germany: Complexity of the genetic early response to growth factors in mouse fibroblasts.

R. Baserga, Temple University School of Medicine, Philadelphia, Pennsylvania: Expression of growth-regulated genes.

E. Harlow, Cold Spring Harbor Laboratory, New York: Protein complexes between dominant and recessive oncoproteins.

E. Ziff, New York University Medical Center, New York: Gene regulation by growth factors and oncogenes.

The Ubiquitin System

March 27-March 30

ARRANGED BY

M.J. Schlesinger, Washington University School of Medicine, St. Louis, Missouri
A. Hershko, Technion-Israel Institute of Technology, Haifa, Israel

SESSION 1: STRUCTURE, CHEMISTRY, BIOSYNTHESIS OF UBIQUITIN

Chairperson: I.A. Rose, Fox Chase Cancer Center, Philadelphia, Pennsylvania

W.J. Cook, University of Alabama, Birmingham: Crystal structure of ubiquitin.
D. Ecker, Smith Kline & French Laboratories, King of Prussia, Pennsylvania: Structures and functional activities of site-specific mutants of ubiquitin.
N. Agell, Washington University School of Medicine, St. Louis, Missouri: In vitro biosynthesis of ubiquitin-containing proteins.
V.A. Fried, St. Jude Children's Research Hospital, Memphis, Tennessee: The intrinsic proteolytic activity of ubiquitin.
T.R. Butt, Smith Kline & French Laboratories, King of Prussia, Pennsylvania: In vivo and in vitro activities of "engineered" ubiquitin conjugates.
K.D. Wilkinson, Emory University, Atlanta, Georgia: Structure and enzymology of ubiquitin-dependent systems.

SESSION 2: UBIQUITIN AND PROTEIN TURNOVER

Chairperson: M. Rechsteiner, University of Utah School of Medicine, Salt Lake City

A. Hershko, Technion-Israel Institute of Technology, Haifa: Selectivity of ubiquitin protein ligase system.
A. Ciechanover, Technion-Israel Institute of Technology, Haifa: Role of arginyl-tRNA-protein transferase in recognition of substrates of the ubiquitin system.
A. Varshavsky, Massachusetts Institute of Technology, Cambridge: The degradation signal in a short-lived protein.
I.A. Rose, Fox Chase Cancer Center, Philadelphia, Pennsylvania: Role of ubiquitin hydrolases in protein breakdown.
D.K. Gonda, Massachusetts Institute of Technology, Cambridge, Massachusetts: The N-end rule in a mammalian cell-free system.
V. Chau, Wayne State University School of Medicine, Detroit, Michigan: Is polyubiquitin the recognition signal?
C.M. Pickart, State University of New York, Buffalo: Mechanisms of inhibition by arsenite of ubiquitin-dependent proteolysis.

SESSION 3: UBIQUITIN GENES AND EXPRESSION

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

D. Finley, Massachusetts Institute of Technology, Cambridge: Functional analysis of the yeast ubiquitin genes.
R.T. Baker, John Curtin School of Medical Research, Canberra, Australia: Structure and expression of the human ubiquitin gene family.
P.K. Lund, University of North Carolina, Chapel Hill: Expression of human ubiquitin genes.
H.L. Ennis, Roche Institute of Molecular Biology, Nutley, New Jersey: Structure of *Dictyostelium discoideum* ubiquitin genes and their regulation during development.
A. Muller-Taubenberger, Max-Planck-Institute for Biochemistry, Martinsried, Federal Republic of Germany: Extended ubiquitin in *Dictyostelium*.
K. Gausing, University of Aarhus, Denmark: Structure and expression of ubiquitin genes in plants.
J.T. Lis, Cornell University, Ithaca, New York: Characterization of ubiquitin gene structure and expression in *Drosophila*.

SESSION 4: UBIQUITIN IN CELLULAR STRUCTURES

Chairperson: A. Varshavsky, Massachusetts Institute of Technology, Cambridge

W.M. Bonner, National Cancer Institute, Bethesda, Maryland: Metabolism of ubiquitinated histone 2A.
J.R. Davie, University of Manitoba, Winnipeg, Canada: Ubiquitinated histones—H2B is preferentially located in transcriptionally active chromatin.
A.L. Haas, Medical College of Wisconsin, Milwaukee: Ubiquitin pools in skeletal muscle.
E. Fryberg, Johns Hopkins University, Baltimore, Maryland: An actin-ubiquitin conjugate in insect flight muscle.
M. van de Rijn, Stanford University School of Medicine, California: Biosynthesis of Mel-14.

SESSION 5: PROTEOLYSIS

Chairperson: A. Ciechanover, Technion-Israel Institute of Technology, Haifa

R.D. Vierstra, University of Wisconsin, Madison: Ubiquitin proteolytic pathway in higher plants.
M. Rechsteiner, University of Utah School of Medicine, Salt Lake City: Ubiquitin/ATP-dependent proteases.
R.G. Kulka, Hebrew University of Jerusalem, Israel: Ubiquitin conjugation patterns in ubiquitin system mutants.
A.L. Goldberg, Harvard Medical School, Boston, Massachusetts: ATP-dependent proteases.
J.F. Dice, Tufts University School of Medicine, Boston, Massachusetts: Lysosomal pathways of protein degradation.
G.N. DeMartino, University of Texas, Dallas: Ubiquitin-mediated and ubiquitin-independent pathways of intracellular proteolysis.
M.R. Maurizi, National Cancer Institute, Bethesda, Maryland: Regulatory functions of ATP-dependent proteases in *E. coli*.

Genetic Approaches to Schizophrenia

April 17–April 20

ARRANGED BY

L. Delisi, State University of New York, Stony Brook
F. Henn, State University of New York, Stony Brook
D. Housman, Massachusetts Institute of Technology, Cambridge
H. Pardes, New York State Psychiatric Institute, New York

SESSION 1: CLINICAL ISSUES RELEVANT TO THE GENETICS OF SCHIZOPHRENIA

Chairperson: H. Pardes, New York State Psychiatric Institute, New York

J.D. Watson, Cold Spring Harbor Laboratory, New York: Introduction.
F. Henn, State University of New York, Stony Brook: The clinical nature of the disease process—Problems of diagnosis and heterogeneity.
Discussion

SESSION 2: CLINICAL GENETICS OF SCHIZOPHRENIA

Chairperson: H. Pardes, New York State Psychiatric Institute, New York

K.S. Kendler, Medical College of Virginia, Virginia Commonwealth University, Richmond: Is there a genetic component in schizophrenia?
Discussion

SESSION 3: REVIEW OF CURRENT FAMILY AND RFLP STUDIES

Chairperson: **F. Henn,** State University of New York, Stony Brook

T. Bishop, University of Utah, Salt Lake City: Applying molecular genetic strategies to the study of schizophrenia—What is needed.

Discussion

SESSION 4: IS A MOLECULAR GENETICS OF SCHIZOPHRENIA POSSIBLE?

Chairperson: **F.S. Collins,** University of Michigan Medical School, Ann Arbor

Overviews: (1) from a psychiatrist; (2) from a linkage expert; (3) from a molecular biologist.

Discussion

SESSION 5: WHAT ARE THE BIOLOGICAL PHENOTYPES OF SCHIZOPHRENIA?

Overviews on various topics in neuroanatomy and neurochemistry.

Discussion

The Molecular Biology of Alzheimer's Disease

April 24–April 27

ARRANGED BY

C.F. Finch, University of Southern California, Los Angeles
P. Davies, Albert Einstein College of Medicine, Bronx, New York

SESSION 1: NEUROCHEMISTRY AND NEUROANATOMY

D.M. Bowen, Institute of Neurology, London, England: Absence of both hypometabolism and widespread loss of pyramidal neurones antemortem?

P. Davies, Albert Einstein College of Medicine, Bronx, New York: Further studies of A68.

C.E. Finch, University of Southern California, Los Angeles: Cloning for mRNAs that have regionally selective alterations in Alzheimer's disease.

F. Hefti, University of Miami, Florida: Nerve growth factor reestablishes several cholinergic pathways—Implications for Alzheimer's disease.

R. Reeves, Johns Hopkins University School of Medicine, Baltimore, Maryland: An animal model for studies of Down's syndrome and Alzheimer's disease.

S.I. Rapoport, National Institute on Aging, Bethesda, Maryland: Is Alzheimer's a phylogenetic disease?

P.D. Coleman, University of Rochester Medical Center, New York: Growth-associated protein (GAP-43) in Alzheimer's disease.

F.H. Gage, University of California, San Diego: Effects of NGF on cholinergic neurons in the central nervous system.

P.L. McGeer, University of British Columbia, Vancouver, Canada: Immune system response in Alzheimer's disease.

J. Rogers, Institute for Biogerontology Research, Sun City, Arizona: Neuroimmunology of Alzheimer's disease.

G.A. Higgins, University of Rochester Medical Center, New York: In situ hybridization of amyloid-β-protein mRNA transcripts in the hippocampal formation in Alzheimer's disease.

C.A. Miller, University of Southern California School of Medicine, Los Angeles: Neuronal specificity in Alzheimer's disease.

J.H. Morrison, Research Institute of Scripps Clinic, LaJolla, California: The cellular, laminar, and regional distribution of neurofilament protein and amyloid-β-protein mRNA in neocortex—Implications for Alzheimer's disease pathology.

D.L. Price, Johns Hopkins University School of Medicine, Baltimore, Maryland: Alzheimer's disease and animal models.

SESSION 2: MOLECULAR BIOLOGY OF PLAQUES AND TANGLES

K. Beyreuther, University of Heidelberg, Federal Republic of Germany: Alzheimer's disease and the amyloid gene product.

K. Goldgaber, National Institute of Neurological and Communicative Disorders and Stroke, Bethesda, Maryland: The amyloid-β-protein precursor gene encodes a family of secreted polyprotein—A hypothesis.

S.A. Johnson, University of Southern California, Los Angeles: β-Amyloid gene expression and cellular localization in Alzheimer's disease brain.

C.L. Masters, University of Heidelberg, Federal Republic of Germany: Molecular basis of amyloidosis in Alzheimer's disease.

B. Muller-Hill, Institut fur Genetik der Universitat, Koln, Federal Republic of Germany: The precursor of Alzheimer's disease A4 protein.

R.L. Neve, The Children's Hospital, Boston, Massachusetts: Expression of Alzheimer amyloid precursor messenger RNAs in the developing adult brain.

D.J. Selkoe, Harvard Medical School, Brigham and Women's Hospital, Boston, Massachusetts: β-Amyloid precursor proteins—Regional CNS processing and comparison of PHF-related proteins.

R. Tanzi, Massachusetts General Hospital, Boston: Molecular genetics analysis of the APP gene.

H.M. Wisniewski, Institute for Basic Research in Developmental Disabilities, Staten Island, New York: β-Peptide precursor protein producing and processing cells.

A. Klug, C.M. Wischik, and Michael Goedert, MRC Laboratory of Molecular Biology, Cambridge, England: Structure and biochemistry of the Alzheimer tangle.

G. Dean, University of Cincinnati College of Medicine, Ohio: Untangling the insoluble—A characterization of Alzheimer's paired helical filaments.

SESSION 3: GENETICS

A.D. Roses, Duke University Medical Center, Durham, North Carolina: Linkage in late-onset Alzheimer's disease.

P.H. St. George-Hyslop, Massachusetts General Hospital, Boston: Molecular genetics of sporadic and familial Alzheimer's disease.

T.D. Bird, Seattle VA Medical Center, Washington: The clinical and neuropathological spectrum of familial Alzheimer's disease in 24 kindreds.

G.D. Schellenberg, University of Washington School of Medicine: Evidence for phenotypic heterogeneity in familial Alzheimer's disease.

R.C. Mohs, Veterans Administration Medical Center, Bronx, New York: Familial aggregation of Alzheimer's disease—Implications for genetic models.

S.B. Prusiner, University of California, San Francisco, School of Medicine: The formation of brain amyloids; molecular genetics of neurodegeneration—The prion model.

Refining Ocular Motor Models through Simulation—Workshop on Computational Neuroscience

July 5–July 9

ARRANGED BY

L. Optican, National Eye Institute, Bethesda, Maryland
S. Hockfield, Yale University, New Haven, Connecticut

SESSION 1: COMPUTER SYSTEMS

L. Optican, National Eye Institute, Bethesda, Maryland

SESSION 2: EYE PLANT

H.P. Goldstein, Wills Eye Hospital, Philadelphia, Pennsylvania
J.D. Enderle, North Dakota State University, Fargo

SESSION 3: VOR

T. Raphan, Brooklyn College, New York
H.L. Galiana, McGill University, Montreal, Quebec, Canada
T.C. Hain, Johns Hopkins Hospital, Baltimore, Maryland

SESSION 4: SACCADES

A.J. van Opstal, University of Nijmegen, The Netherlands
K. Hepp, Eidgenovvische Techn Hock, Zurich, Switzerland
C.A. Scudder, Washington University School of Medicine, St. Louis, Missouri
P. Inchingolo, University of Trieste, Italy
D. Tweed, The University of Western Ontario, London, Canada
S. Grossberg, Boston University, Massachusetts
D.L. Sparks, University of Alabama, Birmingham
D.M. Waitzman, National Eye Institute, Bethesda, Maryland

SESSION 5: PURSUIT

S.G. Lisberger, University of California School of Medicine, San Francisco
D.A. Robinson, Johns Hopkins University, Baltimore, Maryland
R. Krauzlis, University of California School of Medicine, San Francisco
J.R. Carl, National Eye Institute, Bethesda, Maryland
E.L. Keller, Smith-Kettlewell Institute for Visual Science, San Francisco, California
R.H. Wurtz, National Eye Institute, Bethesda, Maryland
L.E. Mays, University of Alabama, Birmingham
F.A. Miles, National Eye Institute, Bethesda, Maryland

Cytoskeletal Proteins in Tumor Diagnosis

October 6–October 9

ARRANGED BY

M. Osborn, Max-Planck-Institute for Biophysical Chemistry, Goettingen, Federal Republic of Germany
K. Weber, Max-Planck-Institute for Biophysical Chemistry, Goettingen, Federal Republic of Germany

SESSION 1: NEURAL AND NEUROENDOCRINE MARKERS

Chairperson: M. Osborn, Max-Planck-Institute for Biophysical Chemistry, Goettingen, Federal Republic of Germany

N.J. Cowan, New York University, New York: Regulation of expression of the genes encoding neurofilament and glial filament proteins.
L.A. Sternberger, University of Maryland, Baltimore: Neurofilament phosphorylation—Reactive and degenerative.
J.Q. Trojanowski, University of Pennsylvania, Philadelphia: Diagnostic problems in neuropathology—An overview of recent efforts to address diagnostic and prognostic problems with monoclonal antibodies to neurofilaments.
M.L. Shelanski, Columbia University College of Physicians & Surgeons, New York, New York: Peripherin and other markers of neural differentiation.
V.E. Gould, Rush-Presbyterian-St. Luke's Medical Center, Chicago, Illinois: Neuroendocrine and nerve sheath tumors.
A.F. Gazdar, Naval Hospital, Bethesda, Maryland: Differentiation and molecular biology of lung cancer.

SESSION 2: DIFFERENTIATION MARKERS IN THE MESENCHYME AND ITS TUMORS

Chairperson: G. Gabbiani, University of Geneva, Switzerland

M. Altmannsberger, University of Giessen, Federal Republic of Germany: Distinction of small round-cell tumors of children with special emphasis on neuroblastomas and rhabdomyosarcomas.
G. Gabbiani, University of Geneva, Switzerland: Actin isoform identification in the diagnosis of soft tissue tumors and of nonmalignant smooth muscle proliferation.
A.M. Gown, University of Washington, Seattle: Anti-actin antibodies—Use in diagnosis.
D. Helfman, Cold Spring Harbor Laboratory, New York: Regulation of expression of marker molecules of myogenesis.
J.S. Morrow, Yale University, New Haven, Connecticut: Spectrins and the cortical cytoskeleton—Tissue specificity.
K. Gatter, John Radcliffe Hospital, Oxford, England: Value of cytoskeletal markers in diagnosis of lymphomas and other tumors.
A.M. Vogel, St. Louis University, Missouri: Melanocyte-specific cytoplasmic antigens.
C.C. Kumar, Schering Corporation, Bloomfield, New Jersey: Regulation of smooth-muscle-specific myosin light-chain-2 isoforms by oncogenes and by tumor-promoting agents.

SESSION 3: DIFFERENTIATION MARKERS: SWITCHES DURING DEVELOPMENT AND USES IN CYTOLOGY AND IN TUMOR DIAGNOSIS

Chairperson: L.A. Sternberger, University of Maryland, Baltimore

L.G. Koss, Montefiore Medical Center and Albert Einstein College of Medicine, Bronx, New York: Diagnostic cytology and cell markers—Some practical considerations.
M. Osborn, Max-Planck-Institute for Biophysical Chemistry, Goettingen, Federal Republic of Germany: IF typing in cytology.
B. Cunningham, Rockefeller University, New York, New York: Cell adhesion molecules.
P. Cowin, New York University, New York: Molecular markers of adhering junctions.
I. Virtanen, University of Helsinki, Finland: Changes of expression of intermediate filaments during development and in culture.
I. Damjanov, Jefferson Medical College, Philadelphia, Pennsylvania: Cytoskeletal and lectin markers of embryonal carcinomas and teratocarcinomas.
D. Louvard, Pasteur Institut, Paris, France: The use of villin for histopathological and serological diagnosis of digestive tumors.

SESSION 4: EPITHELIA AND CARCINOMAS I

Chairperson: T.-T. Sun, New York University, New York

W.W. Franke, German Cancer Research Center, Heidelberg, Federal Republic of Germany: Molecular biological and histological aspects of expression of cytokeratins and desmosomal proteins.

B. Lane, Imperial Cancer Research Fund, Herts, England: Differential expression of keratins as seen by monoclonal antibodies.

J.G. Rheinwald, Dana-Farber Cancer Institute, Boston, Massachusetts: Keratin 19 expression as a marker of premalignancy in oral epithelium.

R. Moll, University of Mainz, Germany: Cytoskeletal markers in the classification of carcinomas and their metastases.

R.B. Nagle, University of Arizona, Tucson: The study of intermediate filaments as an adjuvant to pathological diagnosis.

H. Battifora, City of Hope National Medical Center, Duarte, California: Fixatives and proteases, their effect in the demonstration of intermediate filaments by immunohistochemistry.

M. Miettinen, University of Helsinki, Finland: Intermediate filaments in sarcomas—New findings suggest complex patterns of expression.

SESSION 5: EPITHELIA AND CARCINOMAS II

Chairperson: W.W. Franke, German Cancer Research Center, Heidelberg, Federal Republic of Germany

E.V. Fuchs, University of Chicago, Illinois: Regulation of keratin gene expression in human epithelial cells.

T.-T. Sun, New York University, New York: Pathways of keratinocyte differentiation.

S.P. Banks-Schlegel, National Heart, Lung and Blood Institute, Bethesda, Maryland: Keratin proteins and involucrin—Diagnostic aids in neoplasis.

H. Kahn, Women's College Hospital, Toronto, Canada: Keratin patterns in epithelial tumors.

D.R. Roop, National Institutes of Health, Bethesda, Maryland: The use of monospecific keratin antisera to monitor different stages of carcinogenesis.

F. Ramaekers, University Hospital, Nijmegen, The Netherlands: The use of monoclonal antibodies to cytokeratins in the characterization of epithelial lesions with special emphasis on their application in flow cytometry.

G. Riethmuller, University of Munich, Federal Republic of Germany: Oncogene expression and tumorigenesis of early disseminated cancer cells from human bone marrow—Identification of single tumor cells with anti-cytokeratin antibodies.

The Pancreatic β Cell: Development, Cell and Molecular Biology, and Immunopathology

October 16–October 19

ARRANGED BY

G. Cahill, Howard Hughes Medical Institute, Bethesda, Maryland
D. Hanahan, Cold Spring Harbor Laboratory, New York
H.O. McDevitt, Stanford University School of Medicine, California

SESSION 1: BIOLOGY AND MOLECULAR BIOLOGY OF THE β CELL

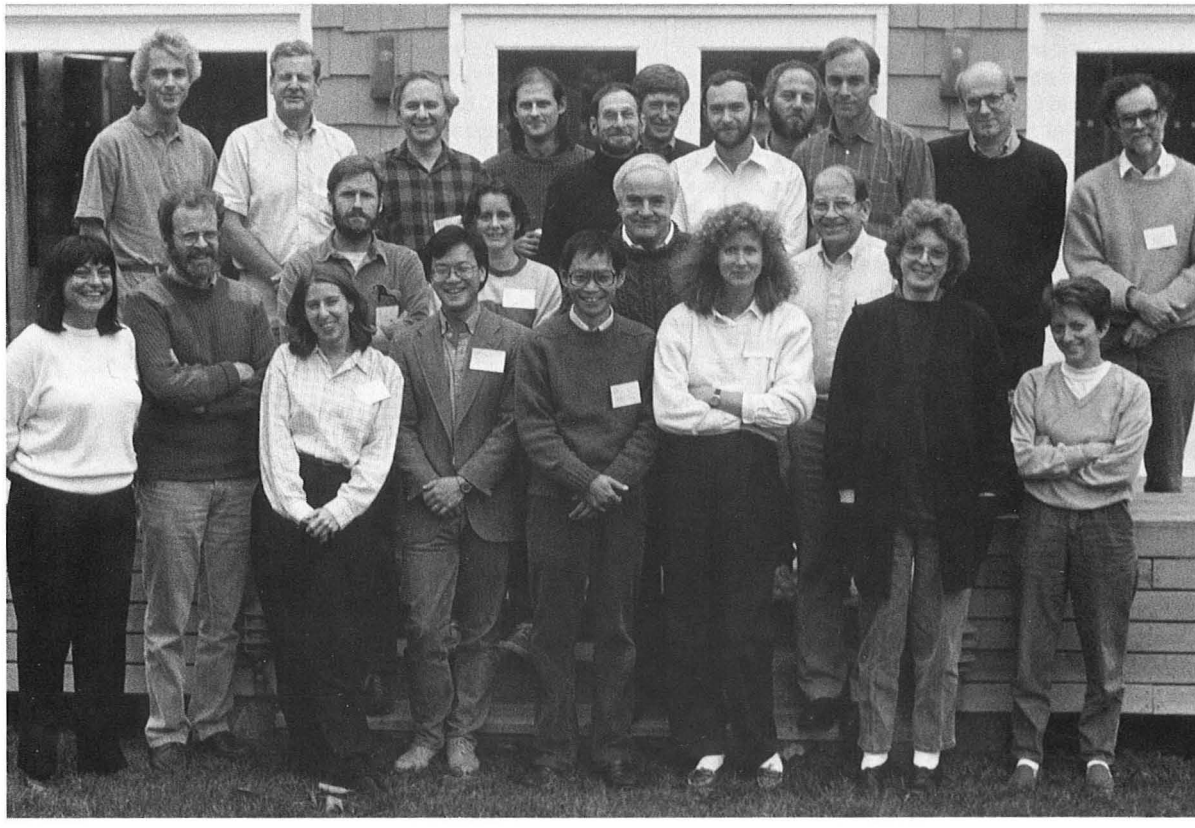
Chairperson: G. Cahill, Howard Hughes Medical Institute, Bethesda, Maryland

D. Steiner, University of Chicago, Illinois: Cellular and molecular biology of the β cell.
W. Rutter, University of California, San Francisco: Insulin genes and receptors.
R. Stein, Vanderbilt University, Nashville, Tennessee: Insulin gene regulation—The role of positive and negative transcription factors in pancreatic β-cell-specific expression.
M.J. Tsai, Baylor College of Medicine, Houston, Texas: Regulation of the rat insulin II gene expression—*cis*- and *trans*-acting factors.
G.I. Bell, University of Chicago, Illinois: Characterization of proteins expressed in the β cell—A molecular analysis.
G. Teitelman, New York Hospital–Cornell University Medical Center, New York: Expression of neural antigens by pancreatic β cells—Developmental implications.

SESSION 2: INSULIN-DEPENDENT DIABETES

Chairperson: J. Kappler, University of Colorado Health Science Center, Denver

G. Cahill, Howard Hughes Medical Institute, Bethesda, Maryland, and Ronald Kahn, Joslin Diabetes Center, Boston, Massachusetts: The nature of diabetes and its physiologic defects.



S. Baekkeskov, Hagedorn University, Gentofte, Denmark: Characterization of the 64K autoantigen in diabetes.
H.O. McDevitt, Stanford University School of Medicine, California: Role of class II MHC molecules in type I diabetes.
E.H. Leiter, The Jackson Laboratory, Bar Harbor, Maine: Genetic control of interferon-γ-induced class-I-like genes in NOD islets and macrophages.
A. Like, University of Massachusetts Medical School, Worcester: Reconstitution studies in the BB/Wor model of spontaneous autoimmune diabetes.

SESSION 3: IMMUNOLOGICAL TOLERANCE

Chairperson: N.A. Mitchison, University of London, England

N.A. Mitchison, University of London, England: General perspectives on tolerance.
J. Kappler, University of Colorado Health Science Center, Denver: Shaping of the T-cell repertoire by tolerance.
J. Sprent, Scripps Clinic, La Jolla, California: T-cell selection in the thymus.
D. Hanahan, Cold Spring Harbor Laboratory, New York: Tolerance or autoimmunity to a transgenic β-cell antigen.
D. Lo, University of Pennsylvania School of Veterinary Medicine, Philadelphia: Transgenic mice with specific expression of class II MHC on β cells—Antigen-presenting function and tolerance induction.
General discussion: Mechanisms of tolerance.

SESSION 4: AUTOIMMUNITY

Chairperson: P. Marrack, Howard Hughes Medical Institute Research Laboratories, Denver, Colorado

N. Sarvetnick, Genentech, Inc., South San Francisco, California: Interferon-γ-induced diabetes in transgenic mice.
J. Sambrook, University of Texas Southwestern Medical Center, Dallas: Expression of a foreign antigen, influenza virus hemagglutinin, on the surfaces of pancreatic β cells in transgenic mice—A model for autoimmune diabetes.
J.F. Bach, Institut National de la Sante et de la Recherche Medicale, Paris, France: MHC-based immunomanipulation of anti-β-cell autoimmunity in NOD mice.
C.A. Janeway, Jr., Yale University School of Medicine, New Haven, Connecticut: Approaches to the analysis of autoantigens.

SESSION 5: TRANSGENIC DIABETES/HORMONE SECRETION

Chairperson: H.O. McDevitt, Stanford University School of Medicine, California

L. Harrison, Walter & Eliza Hall Institute of Medical Research, Melbourne, Australia: Mechanisms of β-cell destruction in type I diabetes—Immune and nonimmune.
D. Mathis, Institut de Chimie Biologique, Faculte de Medecine, Strasbourg, France: Expression of MHC class II molecules on β cells is not a sufficient condition for insulin-dependent diabetes.
N. Sarvetnick, Genentech, Inc., South San Francisco, California: EM analysis of class II expression in β cells of transgenic mice.
S. Efrat, Cold Spring Harbor Laboratory, New York: A new model for diabetes in transgenic mice.
P. Epstein, Baylor College of Medicine, Houston, Texas: Overexpression of calmodulin in β cells of transgenic mice.
R. Kelly, University of California, San Francisco: Hormone secretion of endocrine cells.
L. Villa-Komaroff, The Children's Hospital, Boston, Massachusetts: Mutations of insulin, effects on processing and secretion.

Therapeutic Peptides and Proteins: Formulation, Delivery, and Targeting

October 23–October 26

ARRANGED BY

D.T. Liu, U.S. Food and Drug Adminstration, Bethesda, Maryland
D. Marshak, Cold Spring Harbor Laboratory, New York

SESSION 1: FORMULATIONS

Chairperson: Z. Shaked, CODON, South San Francisco, California

Z. Shaked, CODON, South San Francisco, California: Formulation of pharmaceutical proteins.
A.P. MacKenzie, University of Washington, Seattle: Freeze-drying of peptide and protein-containing sytems.

R. Pearlman, Genentech, Inc., South San Francisco, California: Formulation strategies for recombinant proteins—Growth hormone and tissue-type plasminogen activator.

S. Hershenson, Cetus Corporation, Emeryville, California: Formulation of interferon-β-scr17 (Betascron™), a hydrophobic protein, using a nonionic surfactant.

SESSION 2: ROUTES FOR DELIVERY

Chairperson: S.S. Davis, University of Nottingham, England

S.S. Davis, University of Nottingham, England: Oral administration of peptides.

S. Muranishi, Kyoto Pharmaceutical University, Japan: Biopharmaceutical aspects of enhanced-transmembrane delivery of peptides and proteins.

L. Illum, University of Nottingham, England: Nasal delivery of peptides and proteins.

J.P. Longenecker, California Biotechnology Inc., Mountain View, California: Nasal delivery of proteins for systemic use.

SESSION 3: PHARMACOKINETICS

Chairperson: L.Z. Benet, University of California, San Francisco

L.Z. Benet, University of California, San Francisco: Pharmacokinetics of peptides and proteins—Boundaries of formulation, delivery, and targeting.

S. Poole, National Institute for Biological Standards and Control, Herts, England: Pharmacokinetics and tissue targeting.

M.J. Browne, Beecham Pharmaceuticals Research Division, Surrey, England: Slow in vivo clearance of novel tissue-type plasminogen activator species and hybrid enzymes.

A.M. Breckenridge, University of Liverpool, England: Therapeutic peptides—A clinical pharmacologist's views.

SESSION 4: REGULATORY ASPECTS I

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

S. Sobel, Center for Drug Evaluation and Research, U.S. Food and Drug Administration, Rockville, Maryland: U.S. perspectives on drug regulation.

T. Hayakawa, National Institute of Hygienic Sciences, Tokyo, Japan: Preclinical study groups for biotechnology drugs as an aid in the development of regulatory policies.

SESSION 5: BRAIN PEPTIDES

Chairperson: N. Sherwood, University of Victoria, British Columbia, Canada

L.L. Rubin, Athena Neurosciences, Inc., San Carlos, California: Cell biology of the blood-brain barrier.

J.E. Rivier, Salk Institute, La Jolla, California: Pharmacology of selected hypothalamic releasing factors.

N. Sherwood, University of Victoria, British Columbia, Canada: Formulation and delivery of gonadotrophin-releasing hormones and their analogs for control of reproduction in fish.

SESSION 6: CONTROLLED DELIVERY

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

L. Huang, University of Tennessee, Knoxville: Liposomal delivery of proteins and peptides.

H. Okada, Takeda Chemical Industries, Ltd., Osaka, Japan: One-month release injectable microspheres of leuprolide acetate.

R. Langer, Massachusetts Institute of Technology, Cambridge: Controlled polymeric delivery systems for small molecules and polypeptides.

SESSION 7: GLYCOPROTEINS

Chairperson: D.R. Bangham, National Institute for Biological Standards and Control, Herts, England

J.U. Baenziger, Washington University, St. Louis, Missouri: Structure and function of glycoprotein hormone oligosaccharides.

H. Kinoshita, Chugai Pharmaceutical Co., Ltd., Tokyo, Japan: Pharmacokinetics of recombinant erythropoietin in rats.

J.R. Rasmussen, Genzyme Corporation, Boston, Massachusetts: Targeting of glucocerebrosidase to macrophages.

SESSION 8: CELLULAR APPROACHES

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

D.B. Glass, Emory University, Atlanta, Georgia: Potent, selective peptide inhibitors of cAMP-dependent protein kinase—Structure-function and biostability studies.

J.A. Thompson, National Heart, Lung and Blood Institute, Bethesda, Maryland: Implantable bioreactors—Modern concepts of gene therapy.

J.R. Murphy, Boston University Medical Center, Massachusetts: Diphtheria-toxin-related growth-factor fusion genes—Model systems for target-cell-receptor-specific toxins.

P.W. Trown, XOMA Corp., Berkeley, California: Immunotoxins—Chemistry, biology, and clinical efficacy.

SESSION 9: REGULATORY ASPECTS II

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

E. Esber, Center for Biologics Evaluation and Research, U.S. Food and Drug Administration, Bethesda, Maryland: U.S. perspectives on evaluation of therapeutic biological products.

S.L. Jeffcoate, National Institute for Biological Standards and Control, Herts, England: The European approach to the regulation of therapeutic proteins produced by the new biotechnologies.

SESSION 10: CYTOKINES

Chairperson:

G. Tosato, U.S. Food and Drug Administration, Bethesda, Maryland: Interferon-β-2/B-cell-stimulating factor 2, interleukin 6—A novel cytokine that regulates B- and T-cell growth.

D.L. Urdal, Immunex Corporation, Seattle, Washington: Hematopoietic growth factors—From cloning to clinic.

M. Masui, Otsuka Pharmaceutical Co., Ltd., Rockville, Maryland: Heterogeneity of recombinant products. Human interleukin-Iα and -Iβ.

N. Katre, Cetus Corporation, Emeryville, California: Chemical modification of interleukin-2—A potent drug-delivery system.

M.J. Hawkins, National Cancer Institute, Bethesda, Maryland: Ex vivo activation of leukocytes.

D.R. Bangham, National Institute for Biological Standards and Control, Herts, England: Summary and thoughts for the future.

Development and Application of Molecular Markers to Problems in Plant Genetics

November 1–November 4

ARRANGED BY

B. Burr, Brookhaven National Laboratory, Upton, New York
T. Helentjaris, Native Plants, Inc., Salt Lake City, Utah
S. Tanksley, Cornell University, Ithaca, New York

SESSION 1: SUMMARY OF MAIZE EFFORTS

B. Burr, Brookhaven National Laboratory, Upton, New York: Introduction.

M.G. Murray, Agrigenetics Corporation, Madison, Wisconsin: General considerations on building an RFLP linkage map with specific reference to maize.

B. Burr, Brookhaven National Laboratory, Upton, New York: The application of recombinant inbred lines in the analysis of linkage of RFLP loci and their relationship to traits of interest.

D.A. Hoisington, University of Missouri, Columbia: Correlation of RFLP work with existing maps and coordination of multiple group efforts.

G.E. Hart, Texas A&M University, College Station: Use of existing genetic tools in wheat as they might be applied to RFLP analysis.

P.J. Sharp, Institute of Plant Science Research, Cambridge, England: Construction of RFLP maps in wheat and other related species.

R.C. Shoemaker, Iowa State University, Ames: RFLP analysis in soybean and the special problems using self-pollinated species.

SESSION 2

N. Young, Cornell University, Ithaca, New York: The application of RFLPs to studies in plant evolution—The rice and *Solanaceae* synteny stories.

M.K. Slocum, Native Plants, Inc., Salt Lake City, Utah: The genomic structure of related *brassica* species and subspecies studied by RFLP analysis.

E. Meyerowitz, California Institute of Technology, Pasadena: An RFLP map for *Arabidopsis* and its genetic applications.

Open discussion: Summaries of other mapping efforts.

Moderator: T. Helentjaris, Native Plants, Inc., Salt Lake City, Utah

SESSION 3

R.W. Michelmore, University of California, Davis: Use of an RFLP map for lettuce in the analysis of host-parasite interactions.

M.T. Clegg, University of California, Riverside: Studies of genetic variation between plants by sequence and RFLP analysis.

Roundtable: The use of RFLPs in the study of evolution and systematics, with reference to both research and practical applications.

Moderator: J. Doebley, University of Minnesota, St. Paul

J. F. Wendel and M. Lee, Iowa State University, Ames

SESSION 4: RFLPS AND THE ANALYSIS OF QUANTITATIVE TRAIT LOCI (QTL)

J. Romero-Severson, Agrigenetics Corporation, Madison, Wisconsin: Use of RFLPs for analysis of quantitative trait loci in maize—General considerations and potential impact on crop improvement.

C.W. Stuber, North Carolina State University, Raleigh: Comparative studies using both RFLPs and isozymes as molecular markers to analyze multigenic traits in maize.

J. Nienhuis, Native Plants, Inc., Salt Lake City, Utah: The use of RFLPs to analyze multigenic traits in tomato—The simultaneous selection of contrasting traits.

E. Lander, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts: Mapping QTLs with RFLPs—Mathematical theory and experimental results.

Roundtable: Theoretical considerations for the application of RFLPs to QTL analysis.

Moderator: N. Cowen, United Agriseeds, Inc., Champaign, Illinois

J.S. Beckman, The Volcani Center, Bet Dagan, Israel; M. Edwards, The Pillsbury Company, LeSueur, Minnesota

SESSION 5

D.S. Robertson, Iowa State University, Ames: Understanding the relationship between qualitative and quantitative genetics.

B. Haughe, Massachusetts General Hospital, Boston: Physical mapping in *Arabidopsis* and possible applications of this approach.

M. Wu, Los Alamos National Laboratory, New Mexico: In situ hybridization to physically map cloned probes in plant chromosomes—Physical-recombination map relationships.

T. Helentjaris, Native Plants, Inc., Salt Lake City, Utah: Future directions for both the technology and its applications.

DNA Technology and Forensic Science

November 28–December 1

ARRANGED BY

J. Ballantyne, Office of the Medical Examiner, Suffolk County, Hauppauge, New York
G.F. Sensabaugh, University of California, Berkeley
J.A. Witkowski, Banbury Center, Cold Spring Harbor Laboratory, New York

SESSION 1: FORENSIC USE OF GENETIC INFORMATION—LEGAL AND SOCIAL ISSUES

Chairperson: A.G. Motulsky, University of Washington School of Medicine, Seattle

G.F. Sensabaugh, University of California, Berkeley: Introduction.

J.L. Peterson, University of Illinois at Chicago: Biological evidence and its impact on judicial decision making.

A.G. Motulsky, University of Washington School of Medicine, Seattle: Genetics and society.

D. Nelkin, New York University, New York: Society's use of data.

A. Westin, Columbia University, New York, New York: General aspects of privacy.

P. Reilly, Shriver Center for Mental Retardation, Waltham, Massachusetts: Regulation of access to genetic data.

SESSION 2: BASIC ISSUES—LEGAL AND SCIENTIFIC

Chairperson: G.F. Sensabaugh, University of California, Berkeley

P. Neufeld, New York, New York: The Frye test and the admissibility of scientific evidence.

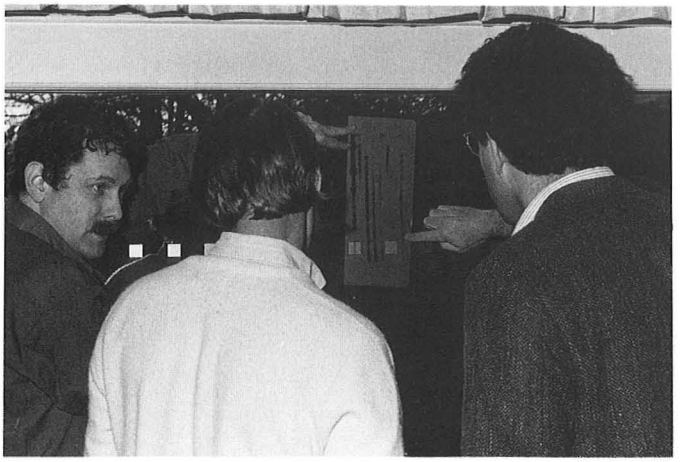
R.P. Harmon, Alameda County District Attorney's Office, Oakland, California: The Frye test—Considerations for DNA fingerprinting.

M. Katzer, Office of the District Attorney, County of Albany,

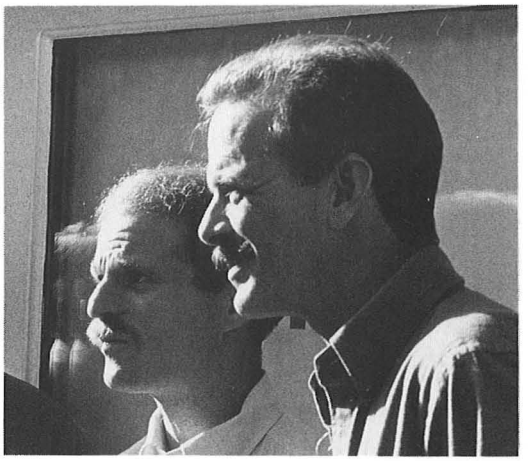
New York: Review of present cases.

C.T. Caskey, Baylor College of Medicine, Houston, Texas: A critical evaluation of the laboratory techniques.

E.S. Lander, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts: The requirements for population studies.

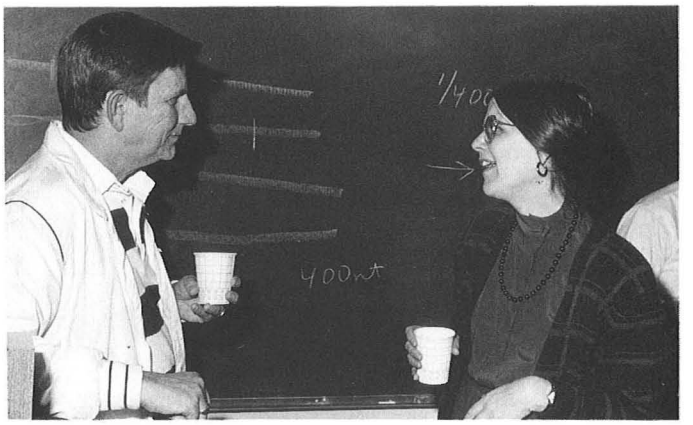


E. Lander, R. Roberts, P. Neufeld



B. Budowle, R. Harmon

D. Werrett, A. Jeffreys



T. Caskey, J. Bashinski

SESSION 3: TRANSFER OF DNA TECHNOLOGY TO THE FORENSIC LABORATORY

Chairperson: J.W. Hicks, FBI Laboratory Division, Washington, D.C.

J.S. Bashinski, Oakland Police Department Crime Lab, California: Laboratory accreditation, training, and certification of staff in the forensic context.

M.L. Baird, Lifecodes Corporation, Valhalla, New York: Quality control and quality assurance.

E.T. Blake, Forensic Science Associates, Richmond, California: DNA analysis and its integration into traditional forensic serology.

Discussion: Practical experiences of the transfer of DNA technology to the forensic laboratory.

Discussants:

J.W. Hicks, FBI Laboratory Division, Washington, D.C.

J. Ballantyne, Office of the Medical Examiner, Suffolk County, Hauppauge, New York

H. Lee, Connecticut State Police Forensic Science Laboratory, Meriden

W.C. Stuber, Metro-Dade Police Department Crime Laboratory, Miami, Florida

B.D. Gaudette, Royal Canadian Mounted Police Central Forensic Laboratory, Ottawa, Ontario

D. Werrett, Home Office Research Establishment, Reading, England

SESSION 4: ADVANCED DNA TECHNIQUES WITH APPLICATION IN THE FORENSIC LABORATORY

Chairperson: C.T. Caskey, Baylor College of Medicine, Houston, Texas

S. Odelberg, University of Utah School of Medicine, Salt Lake City: Tandemly repeated DNA and its applications in forensic biology.

D.D. Garner, Cellmark Diagnostics, Germantown, Maryland: Current case experience with single-locus hypervariable probes.

R. Higuchi, Cetus Corporation, Emeryville, California: Applications of the polymerase chain reaction in forensic science.

A.J. Jeffreys, University of Leicester, England: Minisatellite probes and the polymerase chain reaction.

G.L. Trainor, DuPont Company, Wilmington, Delaware: Fluorescence detection nucleic acid analysis.

M. Hunkapiller, Applied Biosystems, Inc., Foster City, California: Detection systems for DNA sequencing and specific nucleotide sequences.

SESSION 5: ESTABLISHMENT, MAINTENANCE, AND REGULATION OF DATABASES

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

S.D. Rose, Collaborative Research, Inc., Bedford, Massachusetts: Standardization of systems—Essential or desirable?

E.A. Rathbun, FBI National Crime Information Center, Washington D.C.: The NCIC experience.

K.K. Kidd, Yale University School of Medicine, New Haven, Connecticut: The human gene-mapping database.

T.G. Marr, Los Alamos National Laboratory, New Mexico: An analysis system and database for gel images.

D. Boggs, U.S. Court of Appeals, Louisville, Kentucky: Summary.

The Polymerase Chain Reaction

December 11–December 14

ARRANGED BY

H.A. Erlich, Cetus Corporation, Emeryville, California
R. Gibbs, Baylor College of Medicine, Houston, Texas
H.H. Kazazian, Jr., Johns Hopkins Hospital, Baltimore, Maryland

SESSION 1: BASIC TOPICS

Chairperson: T.A. Kunkel, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina

T.A. Kunkel, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: DNA polymerase fidelity.

D. Gelfand, Cetus Corporation, Emeryville, California: Enzymes in PCR.

P. Keohavong, Massachusetts Institute of Technology, Cambridge: Fidelity of DNA amplification in vitro.

R.K. Saiki, Cetus Corporation, Emeryville, California: Optimization of PCR.

M.S. Lee, University of Texas, Houston: Detection of chromosomal translocations by sequence amplification.

M. Perucho, California Institute of Biological Research, La Jolla: Application of PCR to the diagnostic detection of mutant *ras* oncogenes in human tumors by the RNase-A mismatch-cleavage method.

D. Goldgaber, State University of New York, Stony Brook: Problems with fidelity of *Taq* polymerase in searching for mutation in the human *PRP* gene.

SESSION 2: HUMAN GENETIC DISEASE MUTATIONS

Chairperson: O. Smithies, University of North Carolina, Chapel Hill

H.H. Kazazian, Jr., Johns Hopkins Hospital, Baltimore, Maryland: Use of PCR in clinical diagnosis of genetic disease.

S.L.C. Woo, Howard Hughes Medical Institute, Baylor College of Medicine, Houston, Texas: Mutations in phenylketonuria.

D. Valle, Johns Hopkins Hospital, Baltimore, Maryland: Mutation detection and structure-function studies at the ornithine aminotransferase locus.

K. Tindall, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Molecular analysis of mutations at *gpt* locus in Chinese hamster ovary cells.

R. Williamson, St. Mary's Hospital Medical School, London, England: Application of PCR to cystic fibrosis—Prenatal diagnosis and carrier testing.

R. Gibbs, Baylor College of Medicine, Houston, Texas: *HPRT* mutations and competitive oligonucleotide priming.

A.A. van Zeeland, State University of Leiden, The Netherlands: Sequence determination of point mutations at the *HPRT* locus in mammalian cells using *HPRT* cDNA prepared from total cellular RNA.

D. Ginsburg, Howard Hughes Medical Institute, University of Michigan Medical School, Ann Arbor: Human von Willebrand's disease—Analysis of platelet mRNA by PCR.

SESSION 3: ANALYSIS OF HIGHLY POLYMORPHIC REGIONS

Chairperson: R. Williamson, St. Mary's Hospital Medical School, London, England

H.A. Erlich, Cetus Corporation, Emeryville, California: HLA class II polymorphisms—Detection and evaluation.

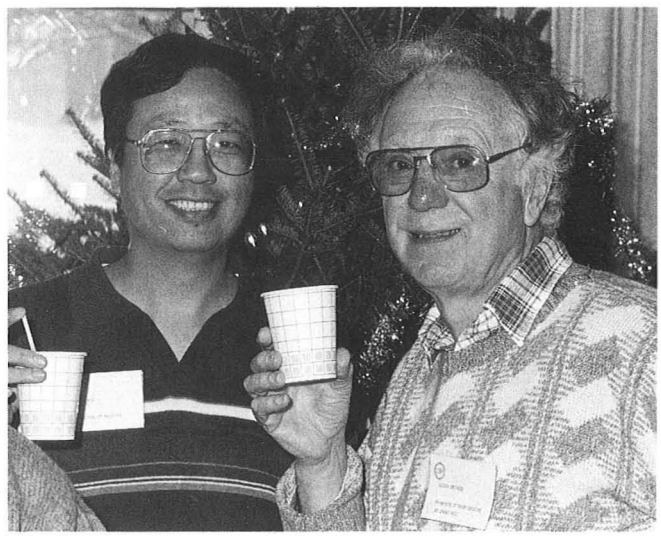
J. Weber, Marshfield Medical Research Foundation, Wisconsin: Length polymorphisms in abundant $(dC\text{-}dA)_n \cdot (dG\text{-}dT)_n$ repeats.

J.A. Todd, John Radcliffe Hospital, Oxford, England: Cloning immune response genes.

G.F. Sensabaugh, University of California, Berkeley: PCR applications in forensic science.

A.F. Markham, ICI Diagnostics, Norwich, Cheshire, England:

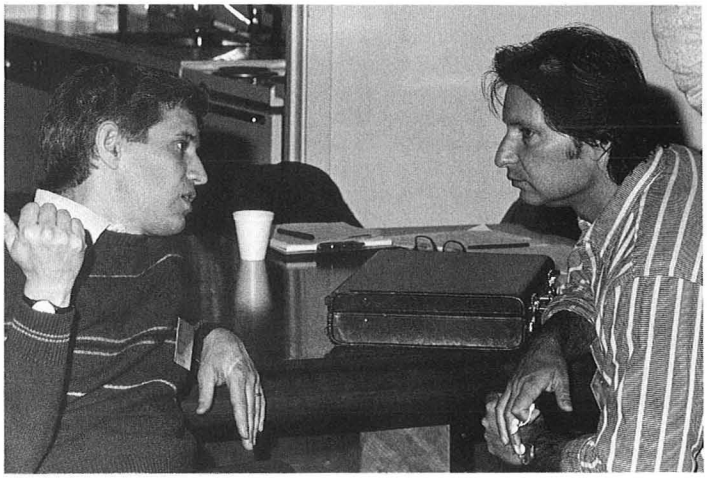
N. Arnheim, H. Kazazian



S. Woo, O. Smithies

Specificity and reproducibility of the PCR.

R.M. Myers, University of California, San Francisco: PCR and denaturing gradient gels.



T. Kunkel, H. Erlich

L.S. Lerman, Massachusetts Institute of Technology, Cambridge: Analysis of single-base changes in the human genome.

SESSION 4: DETECTION OF RARE SEQUENCES

Chairperson: **K.B. Mullis,** XYTRONYX, Inc., San Diego, California

J.J. Sninsky, Cetus Corporation, Emeryville, California: HIV.

B.J. Poiesz, State University of New York Health Science Center, Syracuse: The use of PCR in the detection, quantification, and characterization of human retroviruses.

G. Schochetman, Centers for Disease Control, Atlanta, Georgia: HIV detection.

T.R. Broker, University of Rochester School of Medicine, New York: Synthesis of human papillomavirus cDNAs by PCR amplification.

N. Arnheim, University of Southern California, Los Angeles: Single-cell templates/gene mapping.

O. Smithies, University of North Carolina at Chapel Hill: Use of PCR for detection of targeted gene modifications.

J.S. Chamberlain, Baylor College of Medicine, Houston, Texas: Multiplex PCR for DMD diagnosis.

SESSION 5: ALTERNATIVES, AUTOMATION, AND THE FUTURE

Chairperson: **R.M. Myers,** University of California, San Francisco

H. Lehrach, Imperial Cancer Research Fund Laboratories, London, England: Approaches to a large-scale analysis of mammalian genomes.

L.J. McBride, Applied Biosystems, Inc., Foster City, California: Thermal cycling and automated fluorescent DNA sequencing.

R.K. Wilson, California Institute of Technology, Pasadena: Rapid analysis of T-cell–receptor gene structure and expression.

P.J. de Jong, Lawrence Livermore National Laboratory, California: In vitro mutagenesis via PCR.

R.B. Wallace, Beckman Research Institute of the City of Hope, Duarte, California: Alternative to PCR.

K.B. Mullis, XYTRONYX, Inc., San Diego, California: Variations on the polymerase chain reaction.

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U.S. Department of Justice	DNA Technology and Forensic Science Conference	10/88–9/89	5,000*
NONFEDERAL SUPPORT			
Meeting Support			
Agrigenetics Corp.	Molecular Biology of Plants Conference	1988	1,000*
Alfred P. Sloan Foundation	Journalists and Congressional Workshops	1985–1989	162,000
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Lifecodes Corporation	DNA Technology and Forensic Science Conference	1988	5,000*
Merck Sharp & Dohme Research Laboratories	Control of HIV Expression Conference	1988	7,500*
Molecular Device Corp.	Therapeutic Peptides and Proteins Conference	1988	500*
Otsuka Pharmaceutical Research Center	Therapeutic Peptides and Protein Conference	1988	1,500*
The Plant Cell Research Institute, Inc.	RFLPs and the Molecular Biology of Plants Conference	1988	5,000*
Perkin Cetus Elmer	Polymerase Chain Reaction	1988	35,000*
Repligen Corporation	Control of HIV Expression Conference	1988	3,000*
Sumito Pharmaceutical Research Center	Therapeutic Peptides and Proteins Conference	1988	5,000*
Sungene Technologies Corporation	RFLPs and the Molecular Biology of Plants Conference	1988	1,000*
Takeda Chemical Industries Ltd.	Therapeutic Peptides and Proteins Conference	1988	5,000*
Toyobo New York Inc.	Therapeutic Peptides and Proteins Conference	1988	5,000*
Yamanouchi Pharmaceutical Co., Ltd.	Therapeutic Peptides and Proteins Conference	1988	5,000*

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Banbury Report 29 Therapeutic Peptides and Proteins: Assessing the New Technologies
Banbury Report 30 Eukaryotic Transposable Elements as Mutagenic Agents
Banbury Report 31 Carcinogen Risk Assessment: New Directions in the Qualitative and Quantitative Aspects
Banbury Report 32 DNA Technology and Forensic Science

Current Communications in Molecular Biology

Genetic Improvements of Agriculturally Important Crops: Progress and Issues
Molecular Genetics of Parasitic Protozoa
Antisense RNA and DNA
Viral Vectors
Cell Cycle Control in Eukaryotes
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The Molecular Biology of Alzheimer's Disease
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Development and Application of Molecular Markers to Problems in Plant Genetics
Therapeutic Peptides and Proteins: Formulation, Delivery, and Targeting
Perspectives on the Molecular Biology and Immunology of the Pancreatic β Cell

Other Titles

The Control of Human Retrovirus Gene Expression