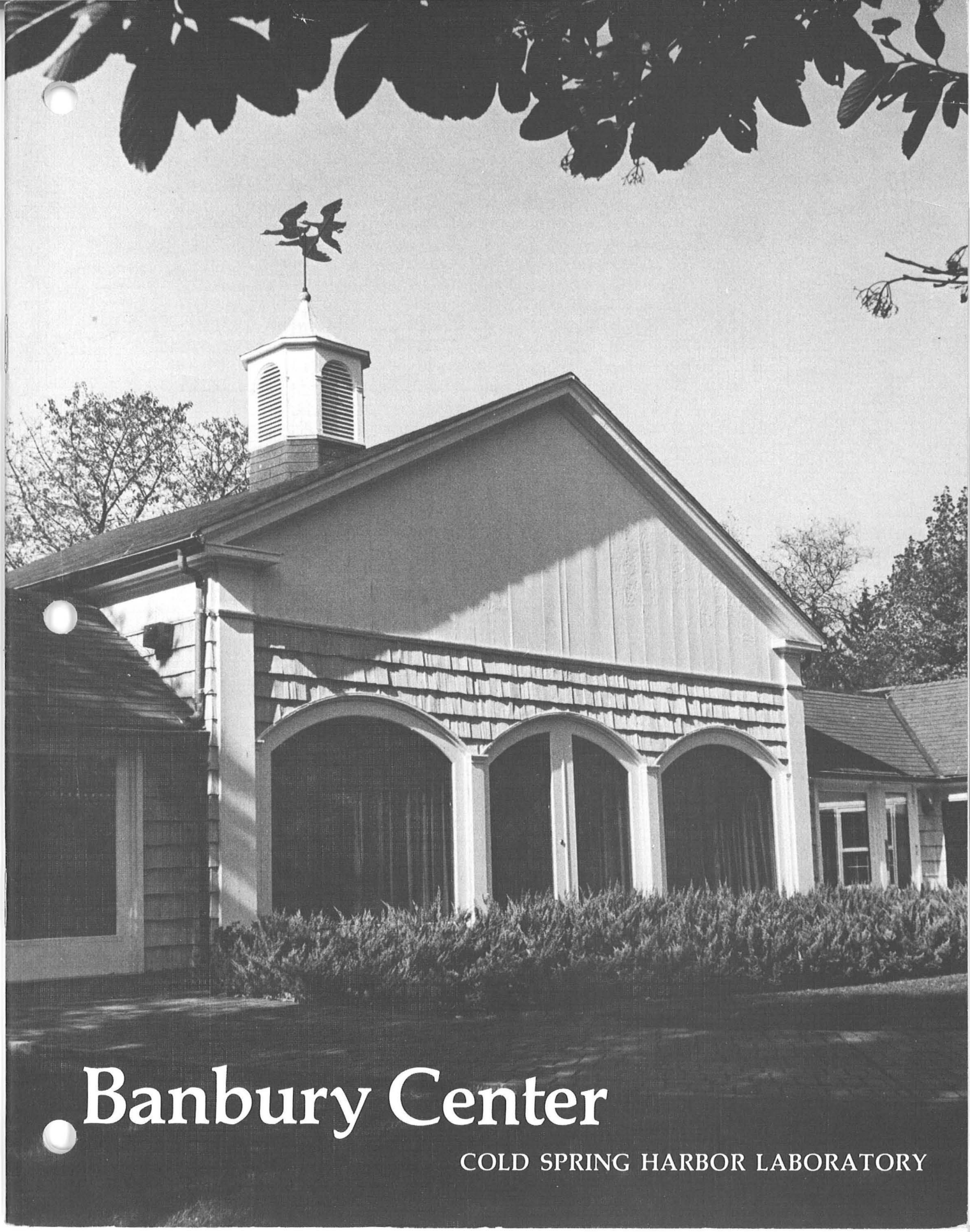


Banbury Center

COLD SPRING HARBOR LABORATORY

BANBURY CENTER DIRECTOR'S REPORT

The ninth year of the Banbury Center's operation saw the continuation of the Center's well-established programs, along with indications of novel directions for our meetings and publications in the next few years. Fourteen meetings were held and, as in previous years, the Center was the location for four advanced lecture courses.

A New Program on the Origins and Detection of Human Cancer

Among the newer aspects of the Center's activities is one that promises to be particularly important for the future—a collaboration with the Preventive Medicine Institute/Strang Clinic of New York City. PMI/Strang has agreed to fund a series of three meetings a year on the Origins and Detection of Human Cancer. These meetings will build on the Center's well-established reputation as a leading location for cancer-related meetings and as a prime source of publications on such topics.

In addition, we hope to bring information from certain Banbury meetings to a larger audience. Our established range of books (discussed below) has an excellent reputation for reporting the data and views of the small groups of about 35 leading scientists who attend each meeting. Such books will continue to play a vital role in disseminating research results to specialists who were not at the meeting. However, it is clear that much of the information discussed at our

Banbury Meeting House

meetings would be very useful and interesting to less-specialized readers, if it were presented in an appropriate form. Therefore, it has been decided that the Center will begin to publish booklets written for nonspecialist scientists and clinicians. Such booklets will be written in-house and will be based on those Banbury meetings that have especially broad implications.

This new source of funding from PMI/Strang Clinic came only a year after the $300,000 grant over three years from the James S. McDonnell Foundation. As expected, this grant has greatly facilitated the Center's ability to organize first-rate meetings at a time when grants from federal agencies have become both scarcer and smaller.

Risk Assessment Program

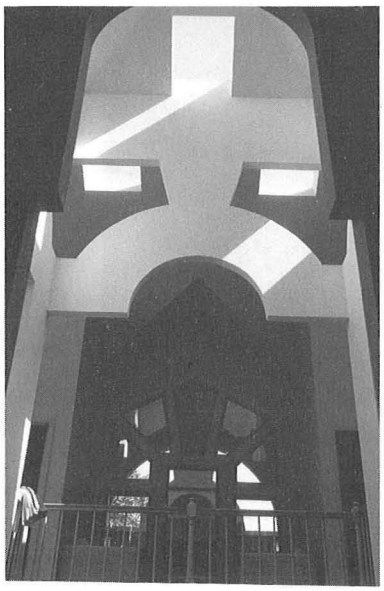
In 1986, four meetings were held within the Risk Assessment Program. This program forms the original core of the Center's activities and has lost none of its importance since the addition of various other programs.

The first meeting in the program concerned Antibiotic Resistance Genes, a topic of great concern, given the ever-increasing use of antibiotics in medicine and animal farming, which has already led to a worrying spread of antibiotic-resistant microbes. The next meeting, on Nongenotoxic Mechanisms in Carcinogenesis, examined the multitude of ways in which known carcinogens interact with cells, apart from their effects on DNA. The most complex problem is to distinguish between the primary and secondary effects of carcinogens. Clearly, this aspect of research will continue to require further intensive study before definitive answers can be obtained.

The first fall meeting was entitled Mechanistic Approaches to Developmental Toxicology. The molecular mechanisms by which certain chemicals interfere with normal development in mammals are now becoming understood in much greater detail. The experts at this meeting reviewed recent results and addressed the vitally important possibility of predicting deleterious effects of new chemicals in medicines or in the environment. The final meeting of the year, the Neurochemistry of Aging, was particularly felicitously timed. Here, several groups reported major advances in our knowledge of the genes and proteins implicated in Alzheimer's disease.

Finally, a workshop closely related to our Risk Assessment program, but organized independently by the National Institute of Environmental Health Sciences, was held in October on DNA Adducts.

Interior of Sammis Hall



Corporate Sponsor Program Continues Its Emphasis on the Applications of Science

The Corporate Sponsor program had another active year. These meetings, which address issues of particular interest to molecular biologists and biotechnologists, have proved to be increasingly popular. Like all other Banbury meetings, invitations to attend are almost invariably accepted—a fact that is very gratifying when one bears in mind that leaders in science receive a steady stream of invitations to meetings that take them away from their laboratories.

The three spring meetings in the Corporate Sponsor series focused on Microbial Energy Transduction, Mechanisms of Yeast Recombination, and DNA Probes. The first addressed fundamental questions about the methods that microorganisms use to convert the energy they receive from nutrients (and, in

some cases, from light) into forms that can be used to maintain their metabolism. The second meeting reviewed the latest knowledge about the molecular mechanisms by which genetic information is recombined and modified in yeasts. Meetings in the Corporate Sponsor series are intended to have a particularly strong emphasis on the application of molecular biology to human health. This aim was very well exemplified by the DNA Probes meeting, at which there were many reports on the ways that diseases can be diagnosed and better understood by examining certain parts of an individual's genetic constitution. Particular interest was also generated by reports on "genetic fingerprinting," a method of examining DNA that can precisely distinguish one individual from any other.

Both of the fall meetings also had very clear applied aspects. Participants at the Tumor Angiogenesis meeting examined newly discovered clues about the manner in which blood is supplied to cancers. Obviously, the hope is that some way will be found to starve tumors of the blood they need to survive. The meeting on Gene Transfer Vectors brought a valuable interchange of knowledge concerning new methods of introducing DNA into cells, one of the crucial steps in all forms of genetic engineering.

The third main facet of the Center's activities consists of the meetings funded by the Alfred P. Sloan Foundation grant, first received in 1980. The 1986 Workshop for Congressional Aides examined the problems caused by radon in homes. Exposure to radon gas, which collects in some homes as it seeps out of the ground, is now thought to be a very significant health hazard, perhaps responsible for as many as 10,000 cases of lung cancer a year in the United States. The experts at this meeting discussed the geographical distribution of radon-rich materials in the ground, the methods by which it can accumulate in houses, the biological effects of high concentrations of radon, and methods for making houses safer. An unusual combination of approaches, ranging from radiation biology through epidemiology to civil engineering, made for an especially stimulating and useful workshop. The aides, many of whom work for members of Congress who represent areas with a major radon problem, received a day and a half of "expert testimony" in an informal setting. Equally importantly, they were able to provide information on the political and economic aspects of the issue.

In keeping with Banbury's purpose of promoting the application of knowledge, chief executive officers of major corporations spent a weekend in October meeting eight of the country's leading scientists. During this meeting, which was organized in collaboration with Shearson Lehman Brothers Inc., the company representatives were able to learn more about the future impact of biological research on their businesses.

Finally, the staff of the Banbury Center was particularly pleased to welcome an assembly of people connected with the Esther A. and Joseph Klingenstein Fund, Inc. The Fund has provided generous support to many younger neuroscientists; this meeting brought them together with the trustees and scientific advisors of the Fund to exchange information on their research. The Banbury Center of Cold Spring Harbor Laboratory was an especially appropriate site for such a gathering, since the Klingenstein Fund has been very generous in its support for the Center and the Laboratory over many years.

Banbury Publications

As noted elsewhere in this Annual Report (see Publications, under Departmental Reports), the organization of Banbury's publications program has been modified. To ensure that the books and other types of publications arising from future

Banbury meetings are published as efficiently and rapidly as possible, the Banbury editorial activities are being more closely integrated into the larger publications department at Cold Spring Harbor Laboratory. This will eliminate some duplication of effort while retaining a full-time editor at the Center.

Departure of Michael Shodell

In March 1986, Michael Shodell left the Center after four years as its Director. Mike's enthusiasm and knowledge had been instrumental in expanding Banbury's activities and consolidating the Center's international reputation. Furthermore, his efforts in raising support have been very important in putting the Center's finances on a sound foundation. We wish him well in his return to a career of teaching at C.W. Post College of Long Island University and scientific writing.

Steve Prentis

Robertson House provides housing and dining accommodations at Banbury Center

MEETINGS

Microbial Energy Transduction: Genetics, Structure and Function

February 23–February 26

ARRANGED BY

D. C. Youvan, Cold Spring Harbor Laboratory, New York

SESSION 1 REACTION CENTER

Chairperson: S. G. Boxer, Stanford University, California

H. Michel, Max-Planck Institut für Biochemie, Munich, Federal Republic of Germany: Structure of the photosynthetic reaction center from *Rhodopseudomonas viridis*.

W. Parson, University of Washington, Seattle: Fast electron transfer steps in photosynthetic reaction centers.

W. Lubitz, Freie Universität Berlin, Federal Republic of Germany: Structural aspects of primary reactants in bacterial reaction centers studied by ENDOR spectroscopy.

B. Marrs, E. I. du Pont de Nemours & Company, Wilmington, Delaware: Molecular genetics in *Rhodopseudomonas capsulata*.

J. T. Beatty, University of British Columbia, Vancouver, Canada: Regulation of expression of the *rxcA* operon of *Rhodopseudomonas capsulata*.

C. Arntzen, E. I. du Pont de Nemours & Company, Wilmington, Delaware: Genetic analysis of PSII polypeptides.

SESSION 2 LIGHT HARVESTING ANTENNAE

Chairperson: S. Kaplan, University of Illinois, Urbana

A. N. Glazer, University of California, Berkeley: Phycobilisomes—Relationship of structure to energy flow dynamics.

R. Huber, Max-Planck Institut für Biochemie, Munich, Federal Republic of Germany: Crystal structural studies of cyanobacterial C-phycocyanins and functional aspects.

D. A. Bryant, Pennsylvania State University, University Park: Genetic analysis of the cyanobacterial phycobilisome.

R. J. Cogdell, University of Glasgow, Scotland: The structure and function of purple bacteria antenna complexes.

H. Zuber, Institut für Molekularbiologie und Biophysik, ETH, Zurich, Switzerland: Structural principles and variability of light-harvesting antennae.

SESSION 3 OXIDOREDUCTASE AND TERMINAL OXIDASE

Chairperson: P. L. Dutton, University of Pennsylvania Medical School, Philadelphia

G. von Jagow, University of Munich, Federal Republic of Germany: Structural and functional diversity of microbial and mitochondrial ubiquinol–Cytochrome *c* reductase.
B. L. Trumpower, Whitehead Institute for Biomedical Research, Cambridge, Massachusetts: Purification and properties of a three subunit cytochrome bc_1 complex from *Paracoccus denitrificans* grown under aerobic and denitrifying conditions.
D. Robertson, University of Pennsylvania Medical School, Philadelphia: Quinones and electrogenic reactions of the bc_1 complex.
R. Prince, Exxon Research and Engineering Company, Annandale, New Jersey: Genetic and biophysical approaches to elucidating the mechanism of the cytochrome bc_1 complex.
R. B. Gennis, University of Illinois, Urbana: Structure and function of the *E. coli* cytochrome *d* terminal oxidase.
T. G. Frey, University of Pennsylvania School of Medicine, Philadelphia: Cytochrome *c* oxidase–Structure and function.

SESSION 4 ATP AND LIGHT DRIVEN PROTON PUMPS

Chairperson: R. M. Pearlstein, Indiana-Purdue University, Indianapolis

P. Pedersen, Johns Hopkins University School of Medicine, Baltimore, Maryland: Structure of F_1 ATPase-metal binding.
H. S. Penefsky, Public Health Research Institute, New York, New York: Mechanism of action of mitochondrial ATPase.
J. E. Walker, MRC Laboratory of Molecular Biology, Cambridge, England: Genes for ATP synthases from photosynthetic bacteria, chloroplasts, and mitochondria.
R. H. Fillingame, University of Wisconsin, Madison: Mutants and function of *E. coli* H^+-ATP synthase.
C. W. Slayman, Yale University Medical School, New Haven, Connecticut: H^+-ATPase of the *Neurospora* plasma membrane.

SESSION 5 TRANSPORT AND CHEMOTAXIS

Chairperson: M. D. Kamen, University of California, San Diego, La Jolla

M. Saier, University of California, San Diego, La Jolla: The bacterial phosphotransferase system–Structure, evolution, and mechanisms of action.
H. R. Kaback, Roche Institute of Molecular Biology, Nutley, New Jersey: Passage to permease.
R. M. Macnab, Yale University, New Haven, Connecticut: Bacterial flagellar motor.
G. R. Moe, University of California, Berkeley: Transmembrane signaling through the aspartate receptor.
M. I. Simon, California Institute of Technology, Pasadena: The role of the receptor in signal transduction.

Mechanisms of Yeast Recombination

March 9–March 12

ARRANGED BY

A. Klar, Cold Spring Harbor Laboratory, New York

SESSION 1 RECOMBINATION HOT SPOT. I

Chairperson: J. R. Broach, Princeton University, New Jersey

M. M. Cox, University of Wisconsin, Madison: The FLP protein of the yeast 2-micron plasmid.
P. D. Sadowski, University of Toronto Faculty of Medicine, Ontario, Canada: The FLP site-specific recombinase of the 2-micron circle of yeast.
J. R. Broach, Princeton University, New Jersey: Function and mechanism of site-specific recombination in yeast plasmids.
M. Jayaram, Research Institute of Scripps Clinic, La Jolla, California: Cuts, gaps, and recombination.
R. A. Butow, University of Texas Health Science Center, Dallas: Mitochondrial DNA recombination.
S. Roeder, Yale University, New Haven, Connecticut: A recombination-stimulating sequence in the yeast ribosomal RNA gene cluster.

SESSION 2 RECOMBINATION HOT SPOT. II

Chairperson: A. Klar, Cold Spring Harbor Laboratory, New York

H. Gutz, Technische Universität, Braunschweig, Federal Republic of Germany: (a) Switching genes in *Schizosaccharomyces pombe*; (b) DNA rearrangements in the mating-type region of *Schizosaccharomyces pombe.*

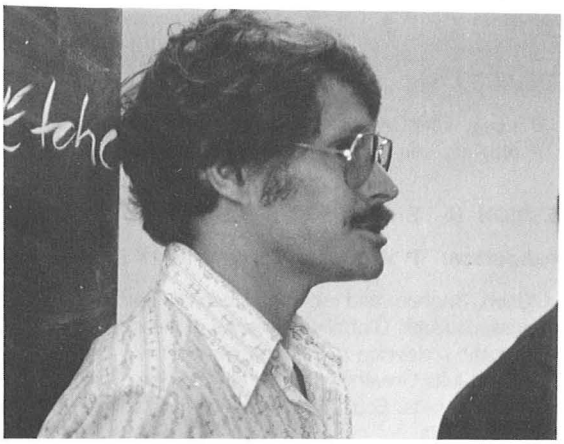
R. Egel, University of Copenhagen, Denmark: Asymmetries in mating-type switching in *Schizosaccharomyces pombe.*

A. Klar, Cold Spring Harbor Laboratory, New York: Developmental switches of the fission yeast mating-type locus.

J. N. Strathern, Frederick Cancer Research Facility, National Cancer Institute, Maryland: Mating-type switching in *Saccharomyces cerevisiae.*

F. Heffron, Research Institute of Scripps Clinic, La Jolla, California: Recombination in yeast is increased near a synthetic HO recognition sequence.

F. W. Stahl, Massachusetts Institute of Technology, Cambridge: Double-strand breaks—Thinking about them in phage and fungi.



J. Strathern

SESSION 3 *REC* GENES AND THEIR PRODUCTS

Chairperson: M. Esposito, University of California, Berkeley

R. E. Esposito, University of Chicago, Illinois: Genes controlling meiotic recombination.

P. J. Hastings, University of Alberta, Edmonton, Canada: Screening for recombination-defective mutants with a positive selection system for plasmid excision.

M. A. Resnick, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Sister chromatid and meiotic recombination.

R. Malone, University of Iowa, Iowa City: Initiation of meiotic gene conversion in yeast.

M. Esposito, University of California, Berkeley: *Rec* mutants and their DNA-binding proteins.

SESSION 4 GENETIC CONSEQUENCES OF RECOMBINATION

Chairperson: F. W. Stahl, Massachusetts Institute of Technology, Cambridge

H. Klein, New York University Medical Center, New York: Recombination between repeated genes.

T. D. Petes, University of Chicago, Illinois: Generation of translocations by meiotic recombination.

J. Haber, Brandeis University, Waltham, Massachusetts: Physical monitoring of recombination events in mitosis and meiosis.

J. Wallace, Columbia University College of Physicians & Surgeons, New York, New York: Genetic control of repeat sequence recombination.

S. Fogel, University of California, Berkeley: Recent molecular-genetic studies on meiotic recombination.

L. Roman, University of Washington, Seattle: Gene conversion and associated recombination in heterozygous vs. heteroallelic diploid cells.

SESSION 5 PHYSICAL CONSEQUENCES OF RECOMBINATION

Chairperson: J. N. Strathern, Frederick Cancer Research Facility, NCI, Frederick, Maryland

S. Kunes, Massachusetts Institute of Technology, Cambridge: Synapsis-dependent mechanism of illegitimate recombination.

D. Kaback, UMDNJ-New Jersey Medical School, Newark: Is there distributive pairing in yeast?

R. Kolodner, Dana Farber Cancer Institute, Boston, Massachusetts: Genetic recombination and mismatch correction catalyzed by cell-free extracts of yeast.

D. J. Garfinkel, Frederick Cancer Research Facility, NCI, Frederick, Maryland: Retrotransposition of Ty elements.

A. Nicolas, Massachusetts General Hospital, Boston: Comparison of yeast and *Ascobolus* recombination.

Evolution and Environmental Spread of Antibiotic Resistance Genes

March 31–April 3

ARRANGED BY

S. B. Levy, Tufts University School of Medicine, Boston, Massachusetts
R. P. Novick, The Public Health Research Institute of the City of New York, New York

SESSION 1A BREADTH OF ENVIRONMENTAL INTERSPECIES GENE EXCHANGE IN THE NATURAL ENVIRONMENT

Chairperson: P. Voytek, U.S. Environmental Protection Agency, Washington, D.C.

T. O'Brien, Brigham and Women's Hospital, Boston, Massachusetts: Global surveillance of the deployment of antibiotic resistance genes and plasmids.

S. B. Levy, Tufts University School of Medicine, Boston, Massachusetts: Ecology of antibiotic resistance determinants.

B. E. Murray, University of Texas Medical School, Houston: Plasmid-mediated penicillinase in enterococci.

F. White, Kansas State University, Manhattan: The exchange of genetic material between higher plants and *Agrobacterium*.

B. R. Levin, University of Massachusetts, Amherst: Population biology of plasmids and transposons—Gene exchange in natural environments.

L. Chao, Northwestern University, Evanston, Illinois: Correlations between antibiotic resistances.

SESSION 1B MICROBIAL ECOLOGY AND GENE EXCHANGE

Chairperson: B. Wiedemann, University of Bonn, Federal Republic of Germany

R. G. Freter, University of Michigan, Ann Arbor: Parameters that are important in the colonization of natural habitats by bacteria, using the large intestine as an example, and the relation between colonization and plasmid transfer.

W. Witte, Institut für Experimentelle Epidemiologie, Wernigerode, German Democratic Republic: Occurrence, development, and spread of antibiotic resistance in *Staphylococcus aureus*, studied in man and in animal husbandry.

P. Smith, University of Galway, Ireland: Uptake of antibiotic resistance plasmid during antibiotic therapy in a salmon hatchery.

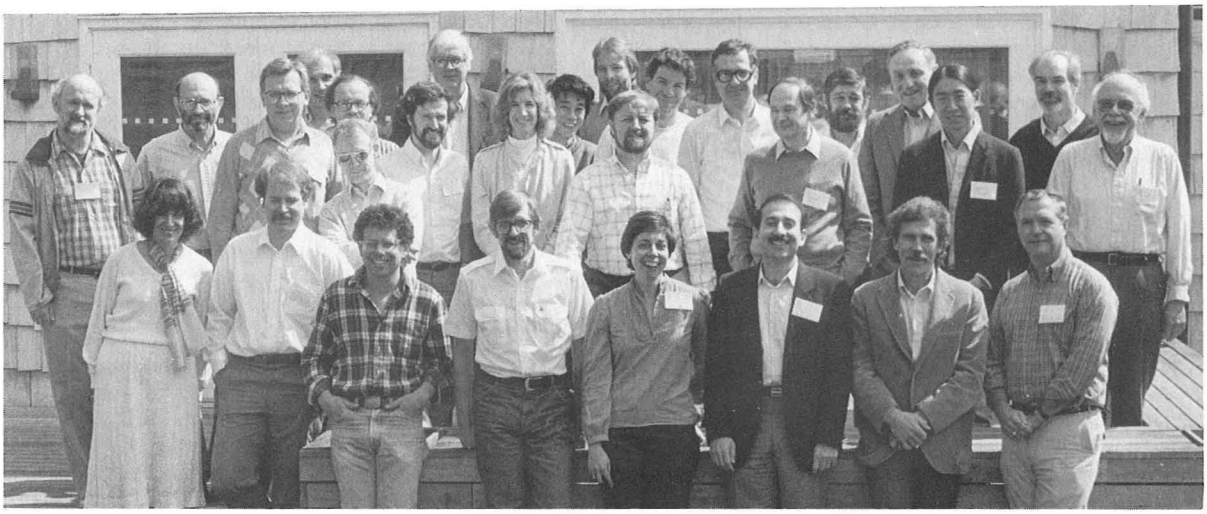
SESSION 2 MOLECULAR MECHANISMS OF GENE TRANSFER

Chairperson: J. R. Scott, Emory University School of Medicine, Atlanta, Georgia

W. Paranchych, University of Alberta, Edmonton, Canada: Comparison of the transfer genes of F-like conjugative plasmids.

D. B. Clewell, University of Michigan, Ann Arbor: Conjugation in streptococci.

H. O. Smith, Johns Hopkins University School of Medicine, Baltimore, Maryland: Genetic transformation in *H. influenzae*.



SESSION 3 FACTORS AFFECTING THE FATE OF TRANSFERRED GENES

Plasmid Replication

Chairperson: D. Sherratt, University of Glasgow, Scotland

J. R. Scott, Emory University School of Medicine, Atlanta, Georgia: Replication regulation in the plasmid prophage P1.
K. Nordstrom, University of Uppsala, Sweden: Molecular aspects on control of replication of plasmid R1.
D. R. Helinski, University of California, San Diego, La Jolla: Regulation of replication of the narrow-host-range plasmid R6K and the broad-host-range plasmid RK2.
M. Bagdasarian, Umea University, Sweden: Proteins required for the broad-host-range mode of replication by the plasmid RSF 1010.
R. H. Rownd, Northwestern University, Chicago, Illinois: IncFII plasmid replication control and stable inheritance.
R. P. Novick, The Public Health Research Institute of the City of New York, New York: Host-specific factors affecting plasmid maintenance.

Plasmid Stability and Partitioning

Chairperson: R. P. Novick, The Public Health Research Institute of the City of New York, New York

S. N. Cohen, Stanford University School of Medicine, California: Chromosomal and extrachromosomal functions that affect plasmid stability in *E. coli*.
D. Sherratt, University of Glasgow, Scotland: Novel recombination mechanisms in the maintenance and propagation of plasmid genes.
S. Molin, The Polytechnical University, Copenhagen, Denmark: Plasmid stabilization in populations of cells.
S. Austin, Frederick Cancer Research Facility, NCI, Frederick, Maryland: The *cis*-acting site responsible for the partition of P1 miniplasmids.

Plasmid and Gene Expression

Chairperson: D. Dubnau, The Public Health Research Institute of the City of New York, New York

J. C. Rabinowitz, University of California, Berkeley: Determinants of transcription and translation in gram-positive microorganisms.
G. C. Walker, Massachusetts Institute of Technology, Cambridge: Plasmid biology of pkM101—The role of the *mucAB* genes.
M. Bibb, John Innes Institute, Norwich, England: Gene expression in the streptomyces.

SESSION 4 ORIGIN AND EVOLUTION OF GENES AND GENE TRANSFER SYSTEMS

Chairperson: S. B. Levy, Tufts University School of Medicine, Boston, Massachusetts

B. Wiedemann, University of Bonn, Federal Republic of Germany: Gene alterations leading to resistance to β-lactam antibiotics.
P. M. Bennett, University of Bristol, England: Transposition and plasmid evolution—Variations on a theme.
D. Dubnau, The Public Health Research Institute of the City of New York, New York: Regulation and evolution of MLS resistance.
S. Harayama, University of Geneva, Switzerland: Mechanisms of and constraints to laboratory evolution of plasmid-specified metabolic pathways.

Nongenotoxic Mechanisms in Carcinogenesis

April 13–April 16

ARRANGED BY

B. E. Butterworth, Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina
T. J. Slaga, University of Texas System Cancer Center, Smithville

SESSION 1 PROMOTION

Chairperson: A. Sivak, Arthur D. Little, Inc., Cambridge, Massachusetts

T. J. Slaga, University of Texas System Cancer Center, Smithville: Skin tumor promotion.
J. DiGiovanni, University of Texas System Cancer Center, Smithville: Studies on the skin-tumor-promoting action(s) anthrone derivatives.
H. C. Pitot, University of Wisconsin Medical School, Madison: Liver tumor promotion.
S. M. Cohen, University of Nebraska Medical Center,

Omaha: Bladder tumor promotion.

B. F. Trump, University of Maryland School of Medicine, Baltimore: Calcium cell injury and tumor promotion.

SESSION 2 FORCED CELL PROLIFERATION

Chairperson: D. S. R. Sarma, University of Toronto, Ontario, Canada

W. Parzefall, University of Vienna, Austria: Measurement and role of stimulation of liver growth in hepatocarcinogenesis.

R. H. Reitz, Dow Chemical Company, Midland, Michigan: Regenerative growth of liver following toxic injury and its role in hepatocarcinogenesis.

D. J. Loury, Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina: The value of measuring cell replication as a predictive index of tissue-specific carcinogenic potential.

E. D. Wachsmuth, Ciba-Geigy AG, Basel, Switzerland: Chemically induced cell turnover in the kidney and its possible role in carcinogenesis.

J. A. Swenberg, Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina: The influence of cytotoxicity in the appearance of induced and spontaneous tumors.

SESSION 3 RODENT BIOASSAYS

Chairperson: P. N. Magee, Temple University School of Medicine, Philadelphia, Pennsylvania

P. M. Newberne, Massachusetts Institute of Technology, Cambridge: Nongenotoxic mouse liver carcinogens.

A. K. Ghoshal, University of Toronto, Ontario, Canada: The induction of liver cancer by dietary deficiency without added carcinogens.

F. J. C. Roe, London, England: The problem of pseudocarcinogenicity in rodent bioassays.

SESSION 4 SOLID STATE CARCINOGENESIS

Chairperson: H. C. Pitot, University of Wisconsin Medical School, Madison

K. G. Brand, Timmendorfer Strand, Federal Republic of Germany: Solid-state carcinogenesis.

M. M. Coombs, Imperial Cancer Research Fund Laboratories, London, England: Biogenic silica fibers and skin cancer.

H. Heck, Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina: The induction of calculi and hyperplasia in weanling rats by terephthalic acid and dimethyl terephthalate—An apparent threshold.

SESSION 5 EXAMPLES OF NONGENOTOXIC CARCINOGENS

Chairperson: H. S. Rosenkranz, Case Western Reserve University, Cleveland, Ohio

W. F. Greenlee, Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina: TCDD—Mechanisms of growth regulation and their potential role in carcinogenicity.

B. E. Butterworth, Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina: DEHP.

R. L. Anderson, The Procter & Gamble Company, Cincinnati, Ohio: The mechanism of nitrilotriacetate (NTA)-associated urinary tract tumorigenesis.

SESSION 6 CELL CULTURE MODELS

Chairperson: L. Diamond, Wistar Institute of Anatomy and Biology, Philadelphia, Pennsylvania

Craig J. Boreiko, Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina: Modulation of transformed focus formation in cultures of C3H/10T1/2 cells.

H. Yamasaki, International Agency for Research on Cancer, Lyon, France: The role of cell-to-cell communication in promotion.

J. C. Barrett, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Epigenetic and genetic mechanisms of presumed nongenotoxic carcinogens.

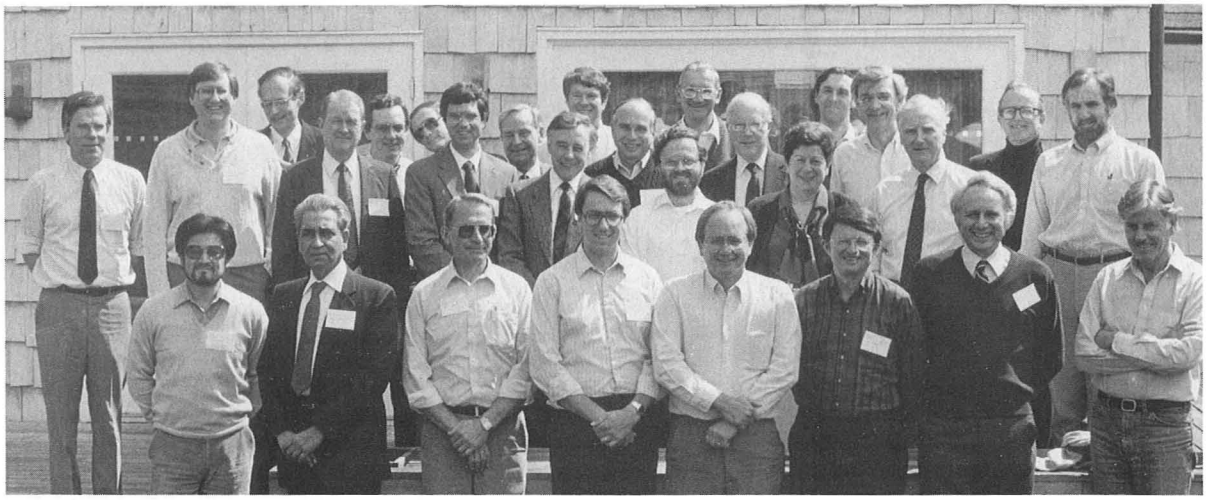
P. A. Cerutti, Swiss Institute for Experimental Cancer Research, Lausanne: Mechanisms of action of prooxidant promoters.

SESSION 7 REGULATORY CONSIDERATIONS

Chairperson: D. E. Stevenson, Shell Development Company, Houston, Texas

R. W. Tennant, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Some implications of National Toxicology Program genetic toxicity test results on chemicals tested in rodents for carcinogenicity and noncarcinogenicity.

H. E. Scribner, Rohm and Haas Company, SpringHouse,



Pennsylvania: Practical approaches to evaluating nongenotoxic carcinogens.

G. N. Williams, American Health Foundation, Valhalla, New York: Definition of human cancer risk.

I. B. Weinstein, Columbia University College of Physicians & Surgeons, New York, New York: Uniform risk assessment policy for all carcinogens.

Applications of DNA Probes

April 20–April 23

ARRANGED BY

L. S. Lerman, Genetics Institute, Cambridge, Massachusetts

SESSION 1 HUMAN GENETIC DISEASE AND CHROMOSOME MAPPING. I

K. E. Davies, John Radcliffe Hospital, Oxford, England: Diagnosis of Duchenne muscular dystrophy, X-linked phosphataemic rickets, and X-linked mental retardation.

L. M. Kunkel, Children's Hospital Medical Center, Boston, Massachusetts: Molecular genetics of Duchenne muscular dystrophy.

C. T. Caskey, Baylor College of Medicine, Houston, Texas: Molecular basis on origin of Lesch-Nyhan mutations.

J.-L. Mandel, Faculté de Medicine de Strasbourg, France: DNA probes and linkage analysis in the region of the fragile X-mental retardation locus.

S. A. Latt, Children's Hospital Medical Center, Boston, Massachusetts: Use of DNA probes to study chromosome deletions and amplification.

T. B. Shows, Roswell Park Memorial Institute, Buffalo, New York: Mapping chromosome II and cancer gene markers.

D. W. Russell, University of Texas Health Science Center, Dallas, Texas: The molecular genetics of familial hypercholesterolemia.

SESSION 2 HUMAN GENETIC DISEASE AND CHROMOSOME MAPPING. II

U. Francke, Yale University School of Medicine, New Haven, Connecticut: Detection of microdeletions with bytogenetics and DNA probes.

A. J. Jeffreys, University of Leicester, England: Hypervariable DNA and genetic "fingerprints."

R. L. White, University of Utah School of Medicine, Salt Lake City: Linkage maps of human chromosomes.

G. Ruvkun, Massachusetts General Hospital, Cambridge: Polymorphism mapping using repetitive elements.

H. Lehrach, European Molecular Biology Laboratory, Heidelberg, Federal Republic of Germany: Molecular approaches to mammalian genetics.

F. S. Collins, University of Michigan, Ann Arbor: Chromosome hopping.

H. Donis-Keller, Collaborative Research, Lexington, Massachusetts: Application of RFLP probes to genetic mapping and clinical diagnosis in humans.

SESSION 3 PHYSICAL SEPARATIONS, NEW PROBE TECHNOLOGY, AND MICROBIOLOGY. I

J. W. Gray, Lawrence Livermore National Laboratory, Livermore, California: Flow cytogenetics—
(1) Chromosome classification and purification;
(2) production of chromosome-specific recombinant DNA libraries; (3) chromosome-specific fluorescence DNA-DNA hybridization.

C. Smith, Columbia University College of Physicians & Surgeons, New York, New York: Macrorestriction

mapping by pulsed-field gel electrophoresis.

M. Olson, Washington University School of Medicine, St. Louis, Missouri: Electrophoretic separations of large DNA molecules.

R. W. Davis, Stanford University Medical Center, California: Separation and mapping of large-molecular-weight DNA by alternating homogeneous electric fields.

D. C. Ward, Yale University, New Haven, Connecticut.

H. A. Erlich, Cetus Corporation, Emeryville, California: Genetic analysis using enzymatic amplification of specific genomic consequences.

A. T. Haase, University of Minnesota Medical Center, Minneapolis: Analysis of infections and pathological conditions by in situ hybridization.

L. Lerman

SESSION 4 PHYSICAL SEPARATIONS, NEW PROBE TECHNOLOGY, AND MICROBIOLOGY. II

M. Ranki, Orion Genetic Engineering Laboratory, Helsinki, Finland: Nucleic acid sandwich hybridization: Methodology and applications to microbial diagnosis.

R. B. Wallace, Beckman Research Institute/City of Hope, Duarte, California: Synthetic DNA probes.

R. M. Myers, University of California, School of Medicine, San Francisco: Assays for detecting single base changes in cloned and genomic DNA.

M. Collins, Genetics Institute, Cambridge, Massachusetts: DNA strand displacement—A novel diagnostic approach.

A. E. Smith, Integrated Genetics, Framingham, Massachusetts: Development of diagnostic DNA probes.

F. C. Tenover, Veterans Administration Medical Center, Seattle, Washington: Use of DNA probes for epidemiologic studies of antibiotic resistance genes.

L. S. Lerman, Genetics Institute, Cambridge, Massachusetts: Helic stability and genetic analysis.

SESSION 5 VIRUSES, CANCER, AND PARASITES

L. Gissmann, German Cancer Research Center, Heidelberg, Federal Republic of Germany: Human papillomavirus DNA in genital cancer.

M. A. Israel, National Cancer Institute, Bethesda, Maryland: Molecular approaches to the diagnosis of cancer.

J. Sklar, Stanford University School of Medicine, California: DNA arrangements in lymphoid neoplasia and their application to diagnosis.

D. H. Spector, University of California, San Diego, La Jolla: Molecular analysis of cytomegalovirus infections.

D. F. Wirth, Harvard School of Public Health, Boston, Massachusetts: DNA probes in the detection of parasitic infections.

K. Davies, A. Jeffreys

Gene Transfer Vectors for Mammalian Cells

October 14–October 17

ARRANGED BY

J. H. Miller, University of California, Los Angeles

SESSION 1

Mutagenesis

M. P. Calos, Stanford University School of Medicine, California: Analysis of mutation in human cells using shuttle vectors.

J. H. Miller, University of California, Los Angeles, and Phaik Mooi-Leong, Yale University, New Haven, Connecticut: Comparison of mutagenesis in bacterial and mammalian cells.

K. Dixon, National Institute of Child Health and Human

Development, Bethesda, Maryland: Use of a SV40-based shuttle vector to analyze spontaneous and UV-induced mutations arising in mammalian cells.

M. Seidman, Otsuka Pharmaceutical Co., Ltd., Rockville, Maryland: Mutagenesis of a shuttle vector plasmid in normal human and xeroderma cells.

SESSION 2

Mutagenesis (continued)

E. Dogliotti, Massachusetts Institute of Technology, Cambridge: Construction of shuttle vectors for studying the genetic effects of defined chemical carcinogen-DNA base adducts in mammalian cells.

V. M. Maher, Michigan State University, East Lansing: Kinds of mutations formed when a shuttle vector containing adduct of BPDE replicates in human cells.

M. Hoekstra, Scripps Clinic and Research Foundation, La Jolla, California: A method of transposon mutagenesis in yeast.

Bacterial Vectors

N. Pagratis, University of Chicago, Illinois: Construction of broad-host-range expression vectors for bacteria.

Vaccinia

B. Moss, National Institutes of Health, Bethesda, Maryland: Vaccinia virus vectors.

Adenovirus

Y. Gluzman, Cold Spring Harbor Laboratory, New York: Adenovirus vectors.

SESSION 3

Mammalian Vectors

Retroviruses

C. Cepko, Harvard Medical School, Boston, Massachusetts: Gene transfer into primary neural cells using retrovirus vectors.

J. Dougherty, University of Wisconsin, Madison: Retrovirus vectors and their variation.

BPV

M. Botchan, University of California, Berkeley: (1) Negative regulation of papillomavirus replicon. (2) Use of retroviruses for the study of DNA tumor virus transformation.

G. N. Pavlakis, N.C.I.-Frederick Cancer Research Facility, Maryland: Applications of BPV and retroviral vectors.

Insect Baculovirus

G. Ju, Hoffmann-La Roche Inc., Nutley, New Jersey: Use of an insect baculovirus vector system.

SESSION 4

EBV

A. J. Levine, Princeton University, New Jersey: Epstein-Barr virus plasmids.

Expression in Mammalian Cells

C. Gorman, Genentech, Inc., South San Francisco, California: Factor VIII expression in mammalian cells.

N. Sarver, Meloy Laboratories, Springfield, Virginia: Expression of complete and abridged F.III using BPV shuttle vectors.

L. McConlogue, Cetus Corporation, Emeryville, California: Amplification vector based on ODCase.

T. V. Ramabhadran, Monsanto Company, St. Louis, Missouri: Host cell-specific variation in the posttranslational processing of engineered proteins.

R. Kaufman, Genetics Institute, Cambridge, Massachusetts: Translational control in transfected mammalian cells.

F. Hutchinson, Yale University, New Haven, Connecticut: Mutagenesis in an *E. coli gpt* gene stably incorporated in the genome of CHO cells.

N. Drinkwater, University of Wisconsin, Madison: Use of EBV shuttle vectors for analysis of mutagenesis in human cells.

M. Calos, Y. Gluzman

J. Miller

SESSION 5

Gene Therapy

D. St. Louis, The Salk Institute, San Diego, California: Transfer of genes in whole animals.

Plants

J. Schell, University of Gent, Belgium: Regulation of expression of genes introduced in plants.

Transgenic Mice

S. Camper, The Institute for Cancer Research, Philadelphia, Pennsylvania: Developmental regulation of the α-fetal protein gene in transgenic mice.

G. Lozano, Princeton University, New Jersey: Regulation of expression of SV40 early genes in transgenic mice.

Mechanistic Approaches to Developmental Toxicology

October 19–October 22

ARRANGED BY

J. A. McLachlan, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina
R. M. Pratt, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina
C. L. Markert, North Carolina State University, Raleigh

SESSION 1 IN VITRO APPROACHES

Chairperson: R. M. Pratt, National Institute of Environmental Sciences, Research Triangle Park, North Carolina

N. Bournais-Verdiabasis, City of Hope Medical Center, Duarte, California: Altered differentiation and induction of heat-shock proteins in *Drosophila* embryonic cells associated with teratogen treatment.

A. Braun, Massachusetts Institute of Technology, Cambridge: Teratogen metabolism.

T. H. Shepard, University of Washington, Seattle: Whole embryo culture—Normal and abnormal development.

L. Saxen, University of Helsinki, Finland: Renal development in vitro.

Discussants: R. E. Morrissey, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina, and F. Welsch, Chemical Industry Institute of Toxicology, Research Triangle Park, North Carolina.

SESSION 2 MOLECULAR AND EXPERIMENTAL EMBRYOLOGY

Chairperson: J. A. McLachlan, National Institutes of Environmental Health Sciences, Research Triangle Park, North Carolina

R. Pedersen, University of California, San Francisco: Cell lineage of mammalian germ layers.

P. M. Iannacone, Northwestern University, Chicago, Illinois: Models of organogenesis based on mosaic pattern analysis in chimeric rats.

M. Levine, Columbia University, New York, New York: Spatial regulation of homeobox gene expression in *Drosophila*.

G. Edelman, Rockefeller University, New York, New York: Role of cell recognition in normal development.

C. L. Markert, North Carolina State University, Raleigh: Are heat-shock proteins involved in development?

Discussants: J. G. Scandalios, North Carolina State University, Raleigh, and L. Saxen, University of Helsinki, Finland.

J. M. Rice, N.C.I.-Frederick Cancer Research Center, Maryland: Mechanisms of transplacental carcinogenesis: Mutation, oncogene activation, and tumor promotion.

SESSION 3 NON-MAMMALIAN MODELS

Chairperson: C. L. Markert, North Carolina State University, Raleigh

J. G. Scandalios, North Carolina State University, Raleigh: Expression of developmentally regulated genes in maize, under normal and stressed conditions.

E. M. Johnson, Jefferson Medical College, Philadelphia, Pennsylvania: Patterns of developmental toxicity evaluated in hydra "embryos."

M. Solursh, University of Iowa, Iowa City: Studies on normal and abnormal differentiation of the chick limb mesenchyme.

T. D. Sabourin, Battelle Columbus Division, Ohio: Comparative evaluation of a short-term test for development effects using frog embryos.

Discussants: D. Kochhar, Jefferson Medical College, Philadelphia. Pennsylvania, and L. Dencker, University of Uppsala, Sweden.

SESSION 4 EXPERIMENTAL ANIMAL-HUMAN COMPARISONS

Chairperson: R. L. Brent, Jefferson Medical College, Philadelphia, Pennsylvania

R. M. Pratt, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Receptor-dependent mechanisms of retinoid-induced craniofacial malformations.

E. J. Lammer, Massachusetts General Hospital, Boston: Patterns of malformations among fetuses and infants exposed to retinoic acid (isotretinoin) in utero.

J. A. McLachlan, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Mechanisms for induction of differentiation defects associated with diethylstilbestrol.

A. F. Haney, Duke University Medical Center, Durham, North Carolina: Structural and functional malformations in humans exposed in utero to diethylstilbestrol.

Discussants: W. J. Scott, Jr., Children's Hospital Medical Center, Cincinnati, Ohio, and R. Miller, University of Rochester School of Medicine, New York

R. L. Brent, Jefferson Medical College, Philadelphia, Pennsylvania: Etiology of unknown causes of birth defects.

SESSION 5 RISK ASSESSMENT

Chairperson: G. P. Oakley, Centers for Disease Control, Atlanta, Georgia

J. Manson, Smith, Kline and French Laboratories, Philadelphia, Pennsylvania: Biological considerations for risk estimation in developmental toxicology.

J. Springer, Food and Drug Administration, Washington, D.C.: Regulatory perspectives of teratogenic risk assessment.

N. Kaplan, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina: Quantification of risk in teratology.

J. Hanson, University of Iowa, Iowa City: Teratogen information systems and their use in assessment of human risk.

Discussants: C. A. Kimmel, U.S. Environmental Protection Agency, Washington, D.C., and G. P. Oakley, Centers for Disease Control, Atlanta, Georgia.

Angiogenesis

November 2–November 5

ARRANGED BY

D. B. Rifkin, New York University Medical Center, New York
M. Klagsbrun, Children's Hospital Medical Center, Boston, Massachusetts

SESSION 1 FGF (OR HBGF); PROTEIN STRUCTURE, GENE STRUCTURE AND RECEPTORS. I

Chairperson: P. A. D'Amore, Children's Hospital Medical Center, Boston, Massachusetts

M. Klagsbrun, Children's Hospital Medical Center, Boston, Massachusetts: Opening remarks.

K. A. Thomas, Merck Sharp & Dohme Research Laboratories, Rahway, New Jersey: Structure and activities of acidic fibroblast growth factor.

M. Petitou, Institut Choay, Paris, France: A heparin hexasaccharide fragment able to bind to anionic endothelial cell growth factor—Preparation and structure.

M. Klagsbrun, Children's Hospital Medical Center, Boston, Massachusetts: Multiple forms of basic FGF.
J. C. Fiddis, California Biotechnology Inc., Mountain View: Genes for the angiogenic growth factors—Basic and acidic FGF.
A. Sommer, Synergen, Inc., Boulder, Colorado: Primary structure of human basic fibroblast growth factor derived from protein and cDNA sequencing.

SESSION 2 FGF (OR HBGF); PROTEIN STRUCTURE, GENE STRUCTURE AND RECEPTORS. II

Chairperson: R. D. Rosenberg, Massachusetts Institute of Technology, Cambridge

T. Maciag, Biotechnology Research Center, Rockville, Maryland: Endothelial cell growth factor and its receptor.
Y. Courtois, INSERM, Paris, France: Modulation of growth factor (EDGFs and FGFs) activity and fixation in development and pathogenesis of the eye.
D. Barritault, Université Paris, France: Eye-derived growth factors—Early events and receptor studies.
D. Moscatelli, New York University Medical Center, New York: Presence of basic fibroblast growth factor in a variety of cells and its binding to cells.
I. Vlodavsky, Hadassah University Hospital, Jerusalem, Israel: Heparin-binding growth factors produced by normal and malignant cells are sequestered and stabilized by the subendothelial extracellular matrix.

SESSION 3 ANGIOGENESIS FACTORS

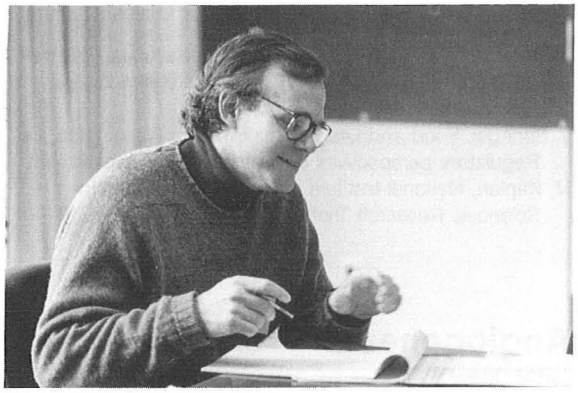
Chairperson: T. Maciag, Biotechnology Research Center, Rockville, Maryland

P. E. DiCorleto, Cleveland Clinic Institute, Ohio: Production of PDGF-like protein by endothelial cells.
A. B. Roberts, National Cancer Institute, Bethesda, Maryland: Type-β-transforming growth factor—Stimulator or inhibitor of angiogenesis?
C. Haudenschild, Boston University School of Medicine, Massachusetts: Nonpeptide angiogenesis factors.
J. Castellot, Harvard University Medical School, Boston, Massachusetts: Differentiation-dependent stimulation of angiogenesis by 3T3-adipocyte.
S. Kumar, Christie Hospital and Holt Radium Institute, Manchester, England: Hyaluronic acid and angiogenesis.
M. J. Banda, University of California, San Francisco: Regulation of endothelial cell metalloproteinase activity.

SESSION 4 ANGIOGENESIS INHIBITORS, BIOLOGY OF VASCULAR CELLS

Chairperson: D. B. Rifkin, New York University Medical Center, New York

J. Folkman, Children's Hospital Medical Center, Boston, Massachusetts: Inhibitors of angiogenesis—Angiogenic steroids.
D. B. Rifkin, New York University Medical Center, New York: Studies on the regulation of protease activity during cell invasion and angiogenesis.
B. M. Glaser, Johns Hopkins Hospital, Baltimore, Maryland: Retinal pigment epithelial cell release inhibitors of neovascularization.
P. A. D'Amore, Children's Hospital Medical Center, Boston, Massachusetts: Role of pericytes in microvascular growth control.
P. Bohlen, University of Zurich, Switzerland: Inhibitors of endothelial cell proliferation.
R. Auerbach, University of Wisconsin, Madison: Endothelial cell specificity and angiogenesis.


D. Rifkin

SESSION 5 ANGIOGENESIS IN VIVO

Chairperson: J. Folkman, Children's Hospital Medical Center, Boston, Massachusetts

W. Risau, Max-Planck Institut, Tubingen, Federal Republic of Germany: Regulation of blood-vessel development.
M. M. Sholley, Virginia Commonwealth University, Richmond: Proliferation and migration of irradiated endothelial cells.
J. M. Davidson, Vanderbilt University School of Medicine, Nashville, Tennessee: Wound repair, growth factors, and connective tissue metabolism.
D. R. Knighton, University of Minnesota Hospital, Minneapolis: Environmental regulation of macrophage angiogenesis.
H. M. Jensen, University of California School of Medicine, Davis: Angiogenesis induced by "normal" human breast tissue—A probable marker for precancer.
J. Folkman, Children's Hospital Medical Center, Boston, Massachusetts: Closing remarks.

Congressional Workshop on Radon in the Home

November 12–November 14

ARRANGED BY

S. Prentis, Cold Spring Harbor Laboratory, New York

SESSION 1

J. Harley, Hoboken, New Jersey: Introduction/history/measurement procedures.
B. L. Cohen, Department of Physics, University of Pittsburgh, Pennsylvania: Distribution of exposures in the United States.

SESSION 2

N. H. Harley, Department of Environmental Medicine, New York University, New York: Epidemiology and risk estimates.
J. T. Tappan, ARIX Sciences Incorporated, Grand Junction, Colorado: Mitigation procedures and results.

SESSION 3

E. Hotte, New Jersey Department of Environmental Protection, Trenton: State responses to the radon problem.
R. Guimond, Office of Radiation Programs, U.S. Environmental Protection Agency, Washington, D.C.: Federal responses to the radon problem.

The Neurochemistry of Aging

November 30–December 3

ARRANGED BY

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

SESSION 1 NEUROCHEMISTRY

Chairperson: P. Davies, Albert Einstein College of Medicine, Bronx, New York

D. M. Bowen, Institute of Neurology, London, England: Neurochemical identity of degenerate (tangle-bearing) cortical neurones.
D. G. Morgan, University of Southern California, Los Angeles: Neurotransmitter receptors in Alzheimer's disease and normal aging.
S. I. Rapoport, National Institute on Aging, Bethesda, Maryland: Functional assessment of altered neurochemistry in aging and Alzheimer's disease—Tissue loss and metabolic deficits as measured with CT and positron emission tomography.
F. H. Gage, University of California, San Diego: Intracerebral neuronal grafting of identified cell types into the aging brain.
C. W. Cotman, University of California, Irvine: Excitatory amino acid receptors and Alzheimer's disease.
G. E. Gibson, Burke Rehabilitation Center, White Plains, New York: Interactions of calcium and neurotransmitter metabolism during aging.
J. Goldman, Albert Einstein College of Medicine, Bronx, New York: Altered calcium metabolism in Alzheimer's disease.

SESSION 2 NEUROENDOCRINOLOGY

Chairperson: C. E. Finch, University of Southern California, Los Angeles

C. E. Finch, University of Southern California, Los Angeles: Neuroendocrine aging—Human brain mRNA.

J. R. Sladek, Jr., University of Rochester Medical Center, New York: Fetal neuronal transplants reverse Parkinsonism symptoms in MPTP-treated monkeys.

J. W. Rowe, Harvard Medical School, Boston, Massachusetts: Sympathetic nervous system activity in aging man.

P. M. Wise, University of Maryland School of Medicine, Baltimore: Hypothalamic monoamine function during aging—Its role in the onset of reproductive infertility.

R. E. Brinton, Rockefeller University, New York, New York: Neurochemical dissection of the mneumonic process—Where the system can falter.

R. M. Sapolsky, Salk Institute, San Diego, California: Protecting the injured hippocampus by attenuating glucocorticoid secretion.

J. H. Morrison, Research Institute of Scripps Clinic, La Jolla, California: Plaque and tangle distribution and cortico-cortical degeneration in Alzheimer's disease.

SESSION 3 FIBROUS PROTEINS

Chairperson: D. J. Selkoe, Brigham and Women's Hospital, Boston, Massachusetts

D. J. Selkoe, Brigham and Women's Hospital, Boston, Massachusetts: Molecular comparison of intraneuronal paired helical filaments and extracellular amyloid fibrils in Alzheimer's disease.

S. B. Prusiner, University of California School of Medicine, San Francisco: Prion proteins and degenerative neurologic disorders.

S.-H. Yen, Albert Einstein College of Medicine, Bronx, New York: Alzheimer's neurofibrillary tangles.

H. M. Wisniewski, Institute for Basic Research in Developmental Disabilities, Staten Island, New York: Ultrastructure, immunology, and biochemistry of paired helical filaments and plaque amyloid.

P. Gambetti, Case Western Reserve University, Cleveland, Ohio: Aging and neuronal cytoskeleton.

F. Gaskin, Oklahoma Medical Research Foundation, Oklahoma City: Autoantibodies to neurofibrillary tangles and brain tissue in Alzheimer's disease and aging.

SESSION 4 CHROMOSOME 21

Chairperson: C. J. Epstein, University of California School of Medicine, San Francisco

C. J. Epstein, University of California School of Medicine, San Francisco: Pathogenic relationships between Down's syndrome and Alzheimer's disease.

D. Patterson, Eleanor Roosevelt Institute for Cancer Research, Denver, Colorado: Somatic-cell genetic and molecular dissection of chromosome 21.

A. C. Warren, Johns Hopkins University, Baltimore, Maryland: DNA polymorphism haplotypes of human chromosome 21—Molecular analysis of the mechanism of nondisjunction.

M. L. Oster-Granite, Johns Hopkins Hospital, Baltimore, Maryland: The trisomic 16 mouse and Down's syndrome—Relevance of Alzheimer's disease.

G. G. Glenner, University of California, San Diego: The amyloid fibril protein(s) of Alzheimer's disease and adult Down's syndrome.

H. M. Wisniewski, Institute for Basic Research in Developmental Disabilities, Staten Island, New York: Neuropathology and dementia in people with Down's syndrome.

SESSION 5 MOLECULAR AND GENETIC APPROACHES TO AGING

Chairperson: L. L. Heston, University of Minnesota, Minneapolis

L. L. Heston, University of Minnesota, Minneapolis: Family studies in Alzheimer's disease.

D. Goldgaber, National Institute of Neurological and Communicative Disorders and Stroke, Bethesda, Maryland: Isolation, characterization, and chromosomal localization of human brain cDNA clones coding for the precursor of the amyloid of Alzheimer's disease and aging brain.

J. F. Gusella, Massachusetts General Hospital, Boston: Investigation of familial Alzheimer's disease of DNA markers.

A. Roses, Duke University Medical Center, Durham, North

Carolina: Molecular genetic strategies in Alzheimer's disease.

P. Davies, Albert Einstein College of Medicine, Bronx, New York: Molecular studies of a new protein in Alzheimer's disease.

Discussants:

D. Aswad, University of California, Irvine

J. H. Morrison, Scripps Clinic and Research Foundation, La Jolla, California

K. O'Malley, Washington University Medical School, St. Louis, Missouri

M. L. Oster-Granite, Johns Hopkins University, Baltimore, Maryland

S. B. Prusiner, University of California, San Francisco, School of Medicine

R. D. Terry, University of California, San Diego

L. P. Weiner, University of Southern California, Los Angeles