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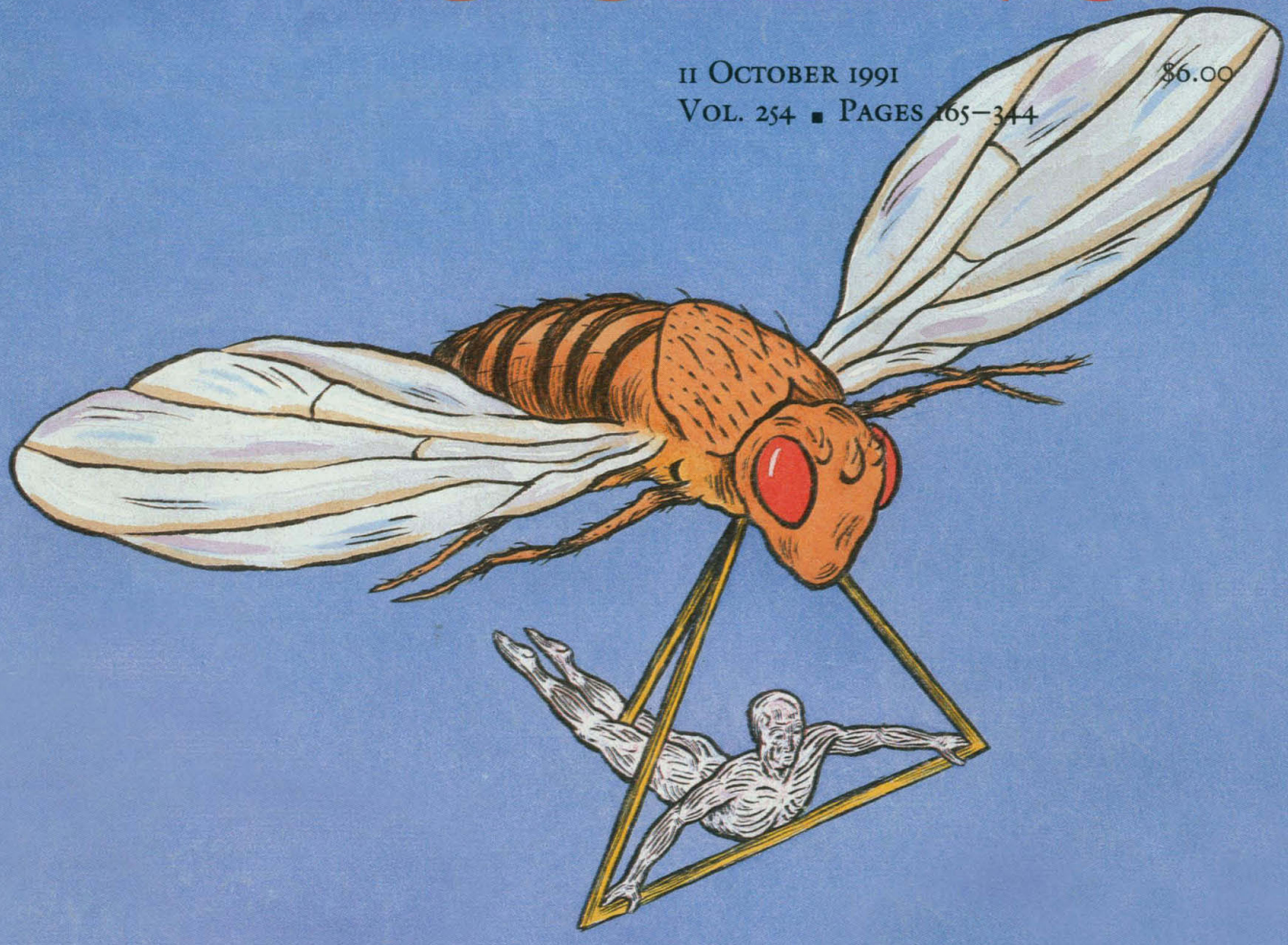

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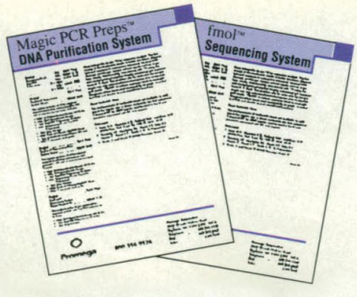

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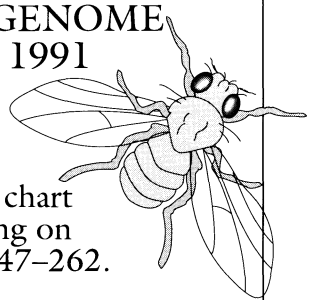

Pullout chart appearing on pages 247–262.

Plus special clip-out guide to genome data bases on pages 201–207.

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COVER Model systems are vital for carrying scientists toward their goal of understanding the human genome. This issue presents a wall chart (pages 247 to 262) summarizing progress in mapping the human genome and one of the classic model systems, *Drosophila melanogaster*. In addition, there is a special news feature on genome databases (pages 201 to 207) as well as articles, reports, and a perspective relating to genome analysis. [Cover illustration by R. J. Kaufman, Charlotte, North Carolina]

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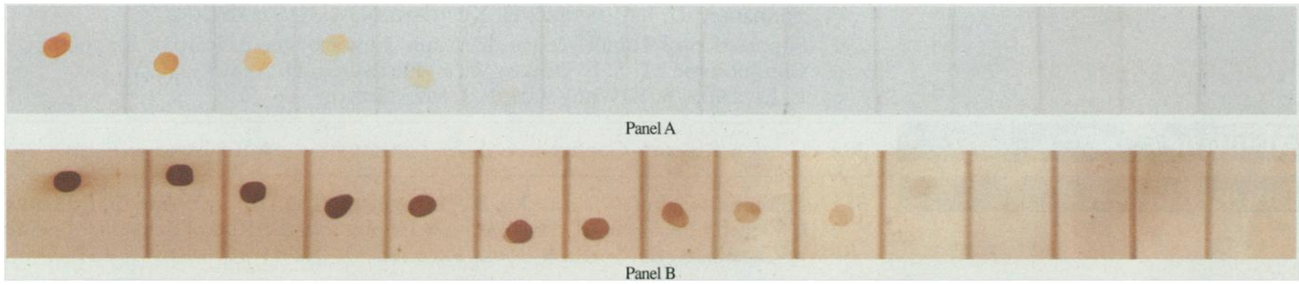

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This Week in
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Genome sequences

The 12 October 1990 issue of *Science* included a state-of-the-art wall chart that illustrated the locations of genes on the chromosomes of humans. Inserted in this week's issue is a comparable wall chart for genes of *Drosophila* and an update of the numbers of human genes and markers that have been collected in the past year. There is also a pull-out section on genome databases. The organization of the *Drosophila* genome and the technology used to sequence it are explained by Merriam *et al.* (page 221). Although the *Drosophila* genome is small (165,000 kilobases) compared with the human genome (3 million kilobases), much information obtained in studies of fruit fly genes pertains directly to chromosomes and genes in other organisms (see Koshland's editorial on page 173). Pearson *et al.* look at the types of genome data that are available and what will be involved in effectively melding disparate data sets in databases and maps (page 214). Who controls genome data? Ongoing battles to patent genome sequences are discussed by Roberts (page 184). Finally, Dowdy *et al.* provide a fine example of how genome sequence information is being put to practical use to determine the function of a tumor gene (page 293).

Wrangellia terrane

Wrangellia terrane includes a massive basaltic plateau that formed in the Pacific Ocean and then accreted onto the continental margin of western North America. The plateau—6000 meters at its thickest—is sandwiched between Triassic marine sedimentary rocks. Richards *et al.* propose that this portion of Wrangellia formed by eruption of a mantle plume; the process would resemble one that has been proposed to explain formation of continental flood basalts (page 263). A plume head would have risen beneath the lithosphere, the ocean floor uplifted, the mantle melted, and basalt erupted. Later, the lithosphere slowly cooled. The thickened crust at Wrangellia did not subduct but accreted onto the continental margin. The authors discuss the relevance of this model to formation of other large oceanic basalt plateaus; concurrent similar events at distant locations might be signs of major thermal changes that were occurring within the Earth's mantle.

Flexibility and specificity

The first six amino acids of the phage protein λ repressor make up the repressor's flexible "arm." This arm wraps around operator DNA and alters gene transcription. Although appearing at first unstructured, the arm becomes highly ordered when it binds, and it is important to site-specific recognition and high-affinity binding between protein and DNA (page 267). Clarke *et al.* obtained high-resolution crystallographic data for the arm in a complex with operator DNA; the structures were obtained at low temperatures, which diminished the arm's thermal motion. The repressor-operator complex could not form if any one of the three lysine residues of the arm was changed to another amino acid (with the exception of arginine, which has a similar structure), whereas amino acids could be substituted at other positions without compromising complex formation. The lysine residues form a number of crucial bonds with guanines and phosphates in the DNA. Flexible arms may, like zinc fingers and helix-turn-helix structures, prove to be common and important DNA-binding "motifs" of proteins.

Cells and cytokines in immunity

Immunologists have long sought to correlate disease susceptibility and resistance with the production of certain types of immune mediators. Such associations have now been made in patients with leprosy. Some people infected with *Mycobacterium leprae* develop pathologic "lepromatous" skin lesions filled with bacteria; at the other extreme are individuals with self-healing "tuberculoid" lesions. The first group is viewed as susceptible to leprosy, whereas the second is resistant as a result of effective cell-mediated immune responses. The lesions of these two groups differ both with respect to the types of T lymphoid cells that they include and the types of factors (cytokines) that the cells release. Yamamura *et al.* report that two types of cytokines are preferentially made in the resistant lesions—interleukin-2 and interferon-γ (page 277). Interleukin-4 is the major cytokine produced in lesions of susceptible individuals. Salgame *et al.* found that the tuberculoid lesions have a subset of helper $CD4^+$ T cells that release interferon-γ and interleukin-2; lepromatous lesions have suppressor $CD8^+$ T cells that release interleukin-4 (279). Correlations of subsets of cells and their cytokines with effective immune responses is a step toward inducing desired cells and factors with vaccines or immunotherapy.

Forebrain formation

During mammalian brain development, the deepest of the six layers of the cerebral cortex forms first, and increasingly superficial layers are laid down subsequently and in order. The deepest layer is populated by the first cells to leave the cell cycle, the next set of cells "homes" to the next layer, and so on. Thus it is possible that a cell's "birthdate" may determine its destiny. In a series of transplantation experiments McConnell and Kaznowski found a somehat more complex situation (page 282). Newly generated neuronal cells destined for deep layers of the brains of ferret embryos homed to deep layers of the brains of somewhat older recipient ferrets as well, possibly guided there by cell surface molecules. If, however, the progenitors of these cells were transplanted to the older hosts and allowed to reenter the cell cycle, they received clues from the local environment and switched fates, ending up in a more superficial layer. ■ RUTH LEVY GUYER

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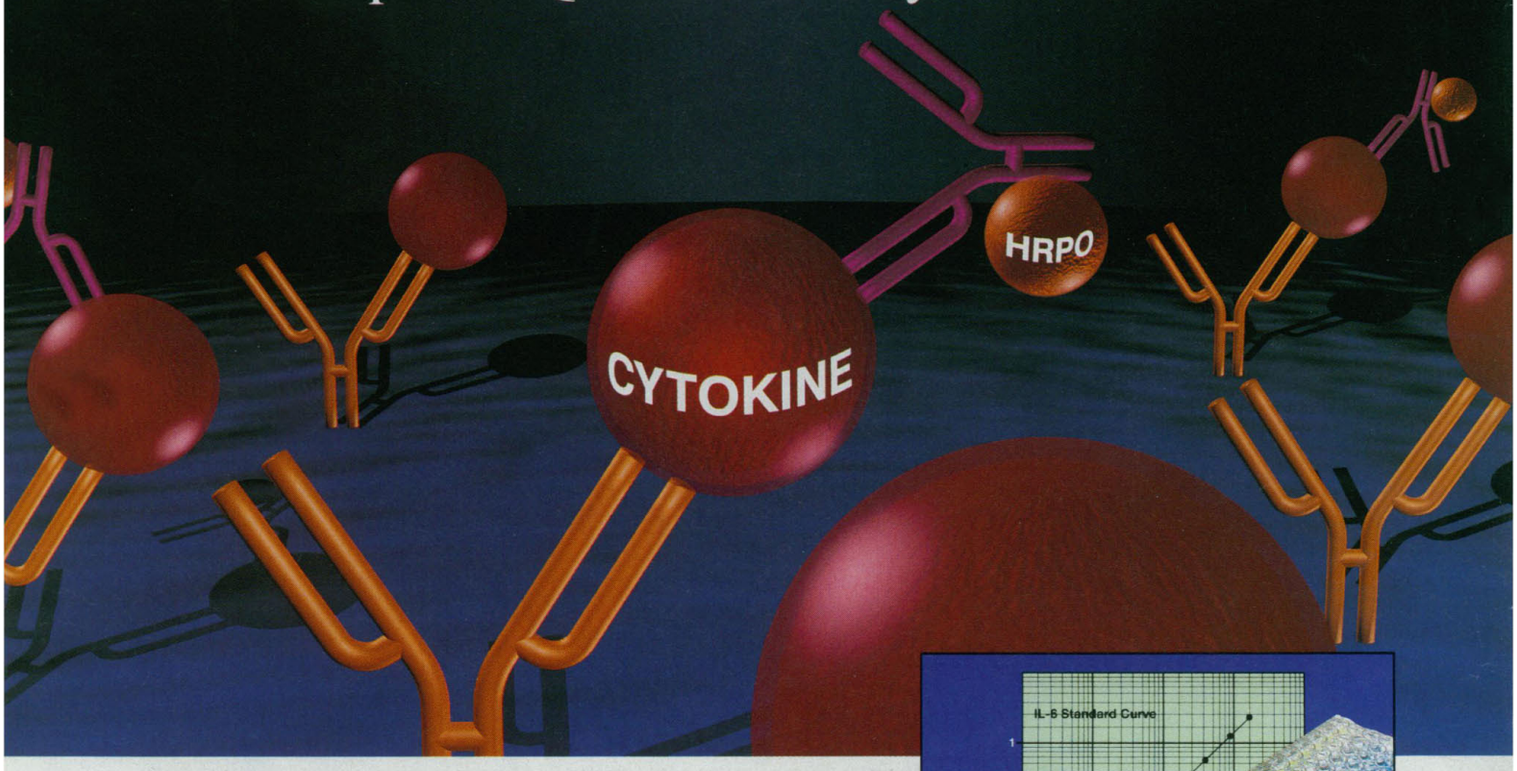

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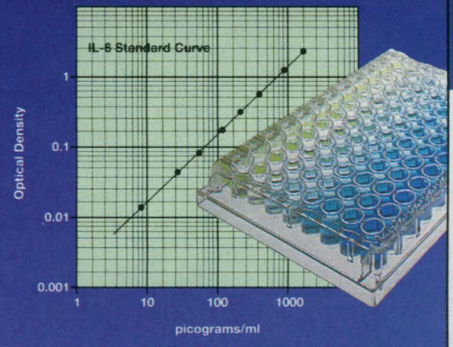

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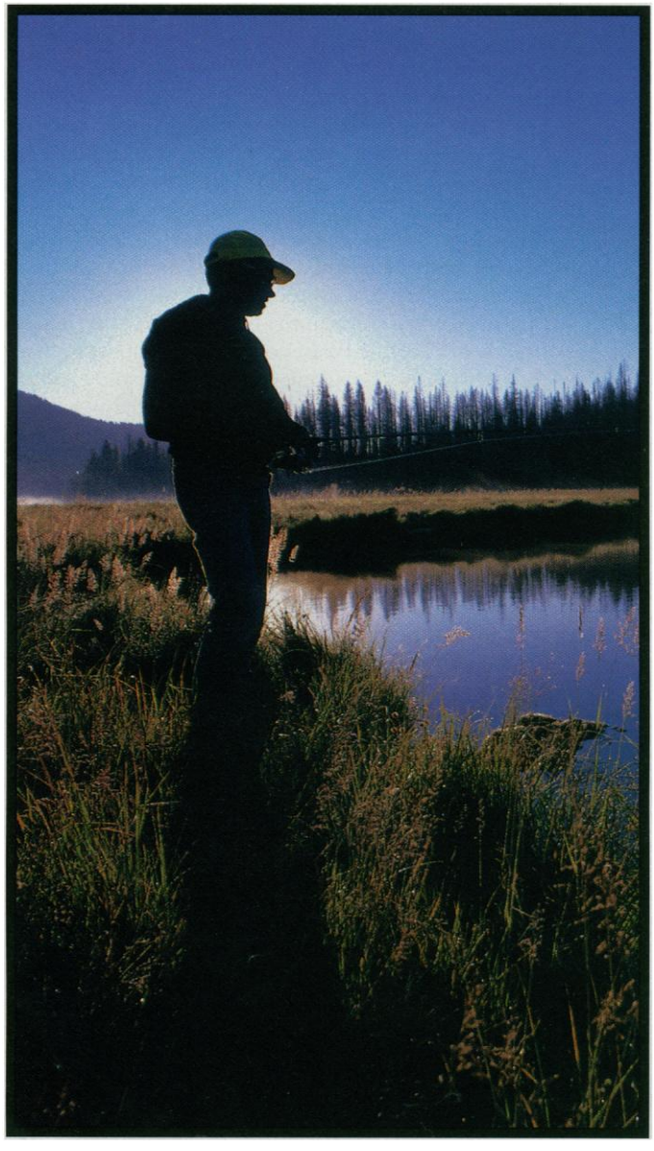

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Age I	A/CCGGT TGGCC/A	552
Bpm I (*Gsu* I)	CTGGAG (16/14) GACCTC	565
*Bpu*1102 I (*Esp* I)	GC/TNAGC CGANT/CG	ER0091
*Bsa*H I (*Aha* II)	GPu/CGPyC CPyGC/PuG	556
Bsg I	GTGCAG (16/14) CACGTC	559
Bsi E I (*Mcr* I)	CGPuPy/CG GC/PyPuGC	554
Bsi W I (*Spl* I)	C/GTACG GCATG/C	553
Bsl I (*BsiY* I)	CCN$_5$/NNGG GGNN/N$_5$CC	555
*Bsp*D I (*Cla* I)	AT/CGAT TAGC/TA	557
Bsr F I (*Cfr*10 I)	Pu/CCGGPy PyGGCC/Pu	562
Bst 1107 I (*Sna* I)	GTA/TAC CAT/ATG	ER0701
*Ear*1105 I	GACNNN/NNGTC CTGNN/NNNCAG	ER0241
*Ecl*136 II (*Sac* I)**	GAG/CTC CTC/GAG	ER0251
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*Eco*57 I	CTGAAG (16/14) GACTTC	ER0341
*Esp*3 I	CGTCTC (1/5) GCAGAG	ER0451
Mun I (*Mfe* I)	C/AATTG GTTAA/C	ER0751
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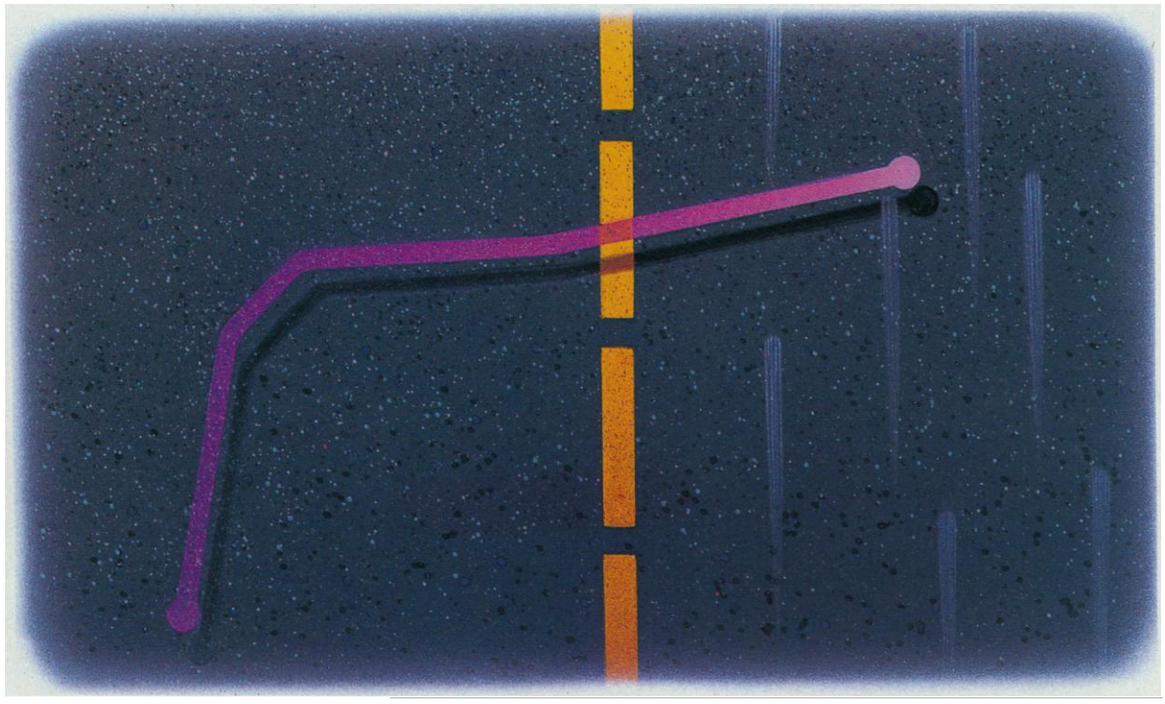

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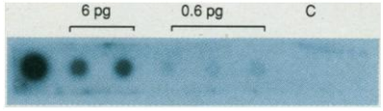

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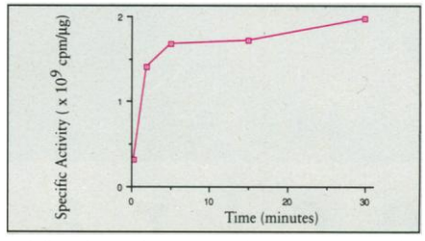

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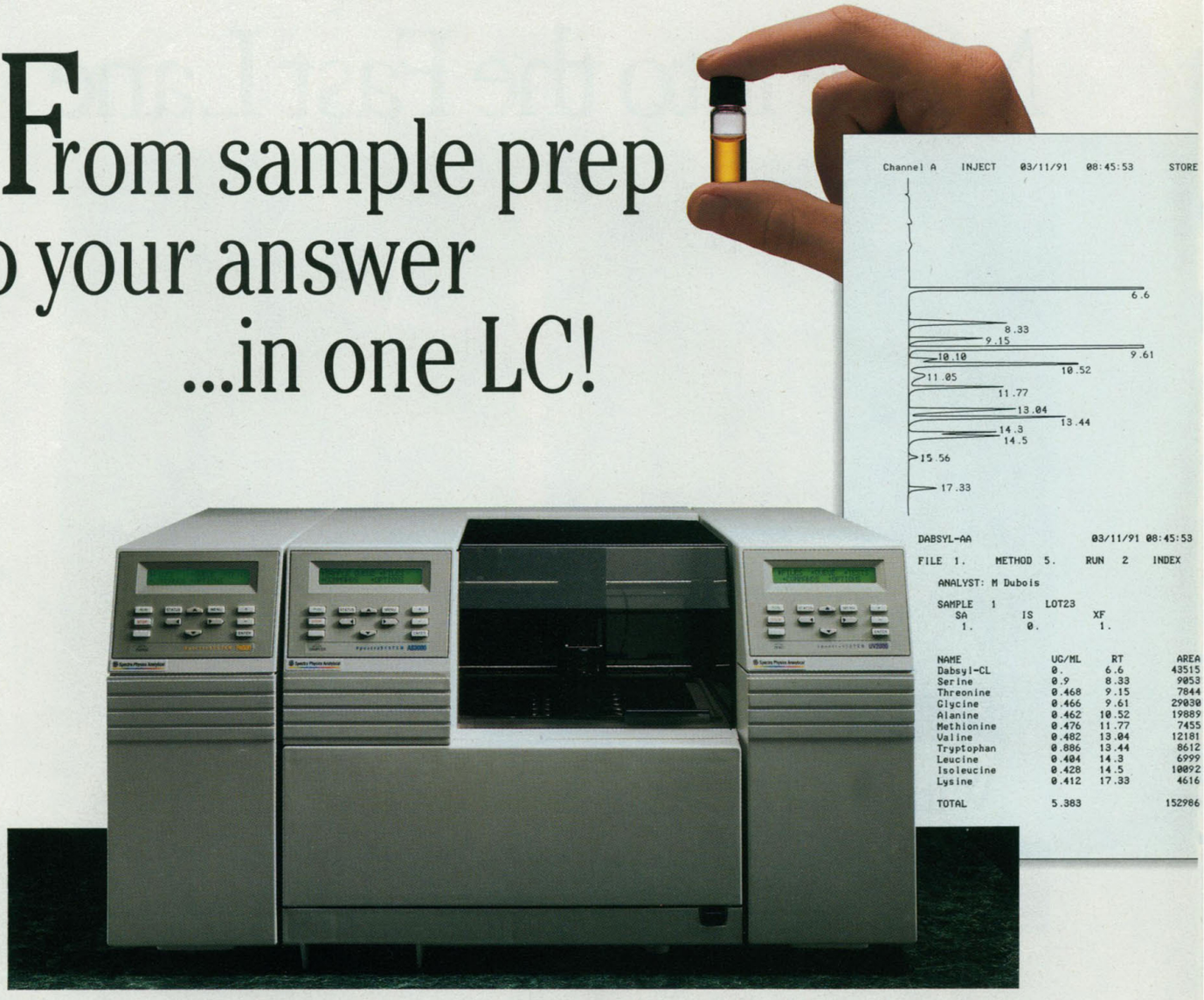

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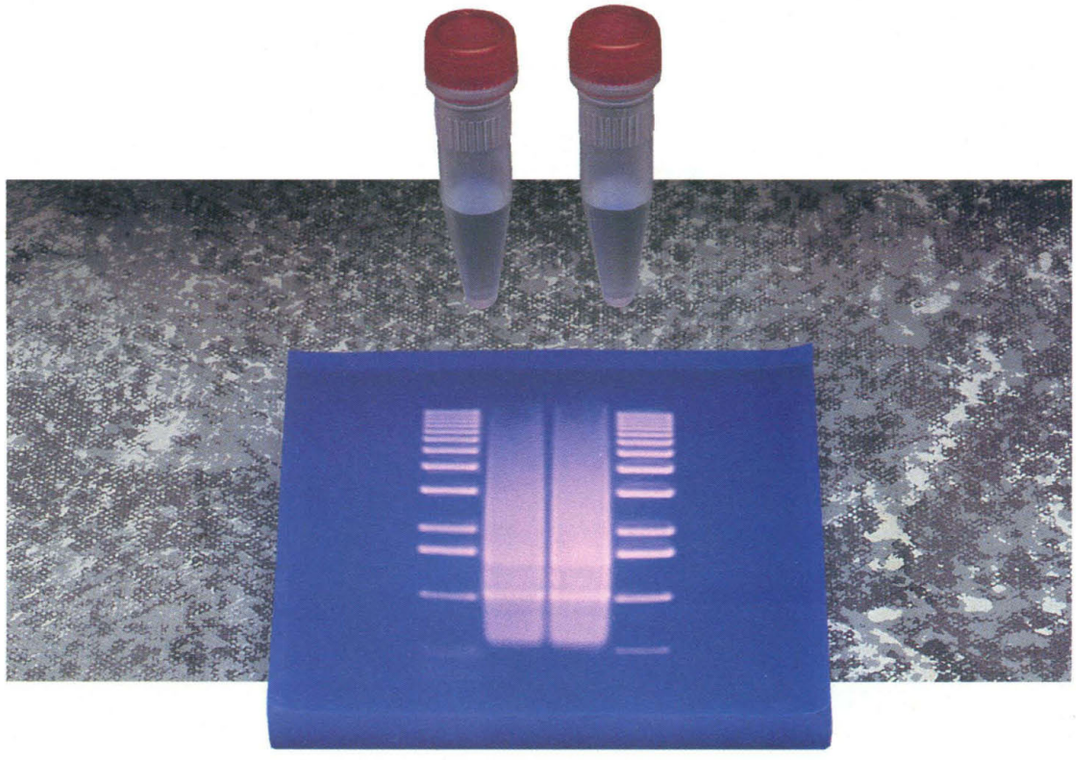

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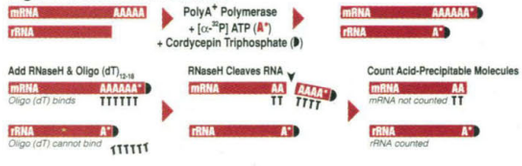
Figure 1: mCheck Procedure



In the presence of cordycepin triphosphate, PolyA polymerase adds 1–2 radiolabelled ATP's to 3' ends of all molecules. Oligo dT binds to RNA with true PolyA+ tails and RNase H cleaves the resulting hybrids. TCA precipitable counts are proportional to polyA+ RNA in the sample.

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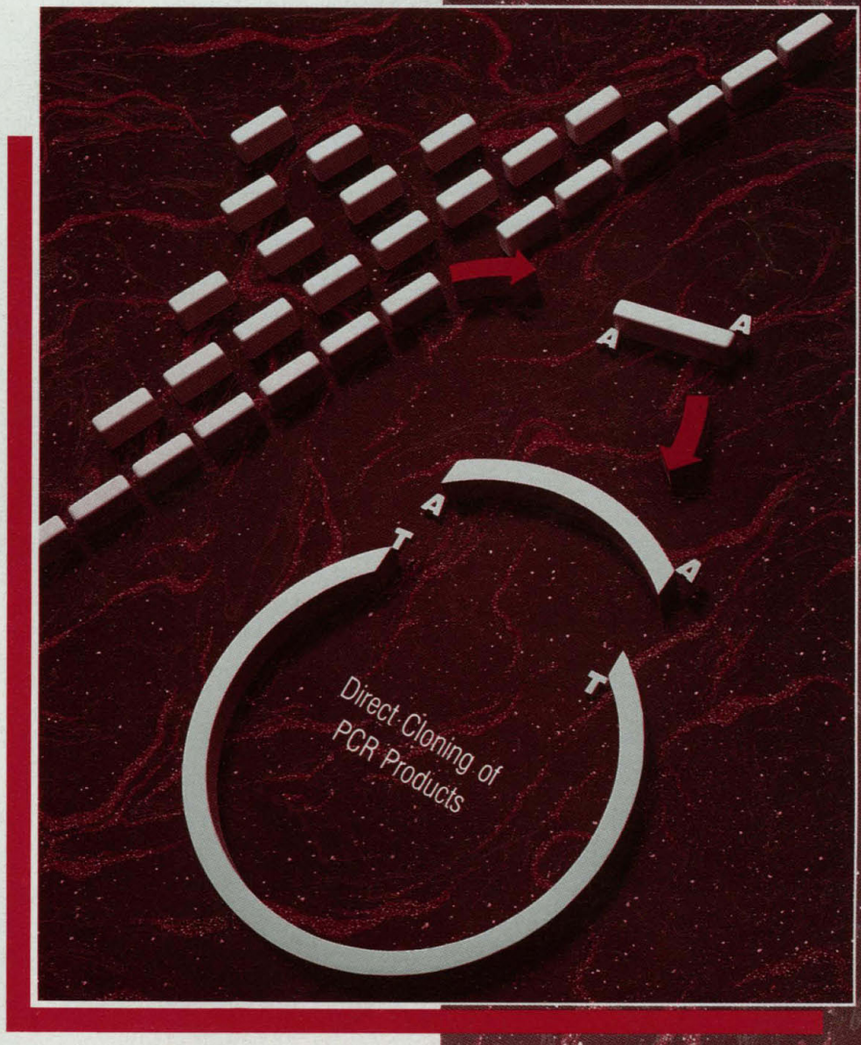

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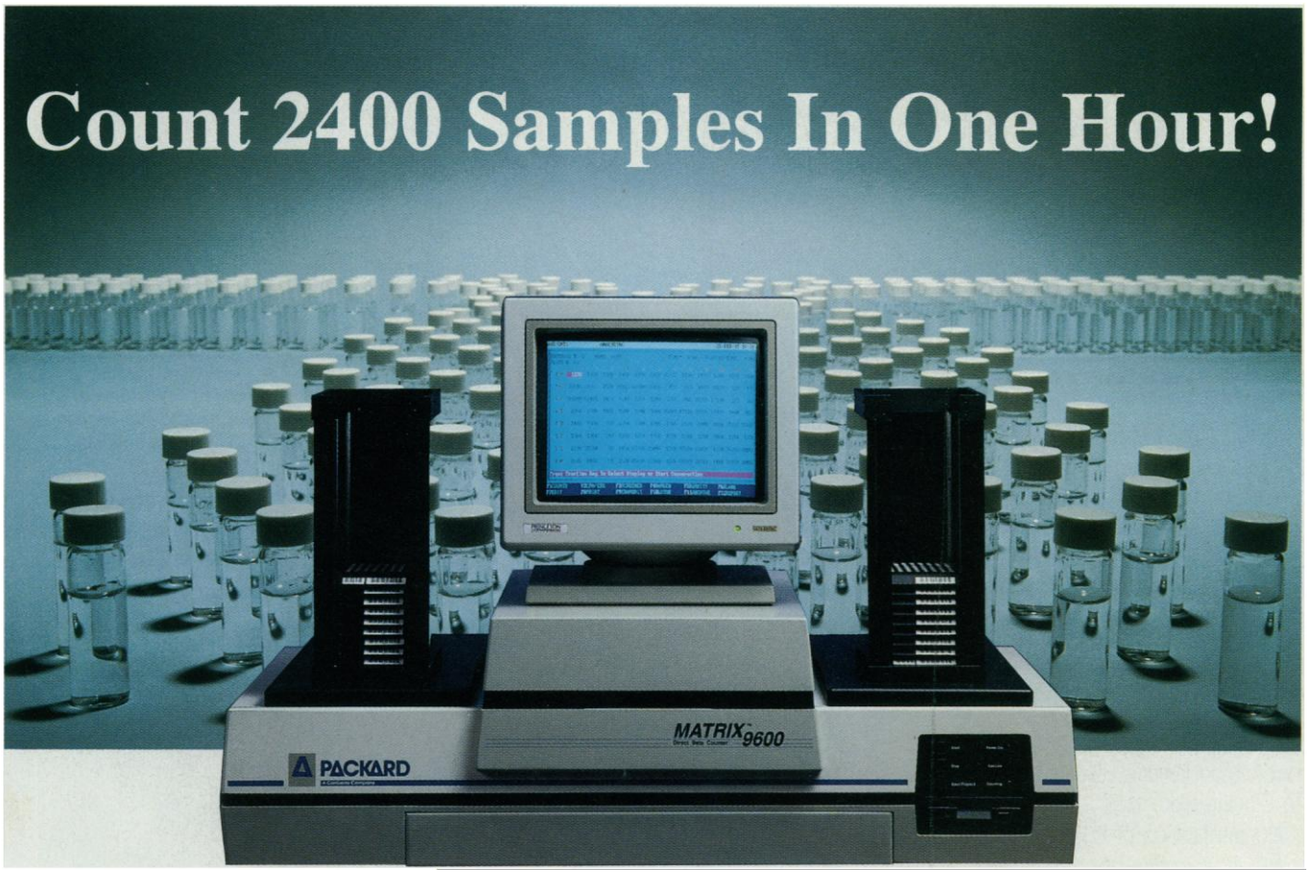

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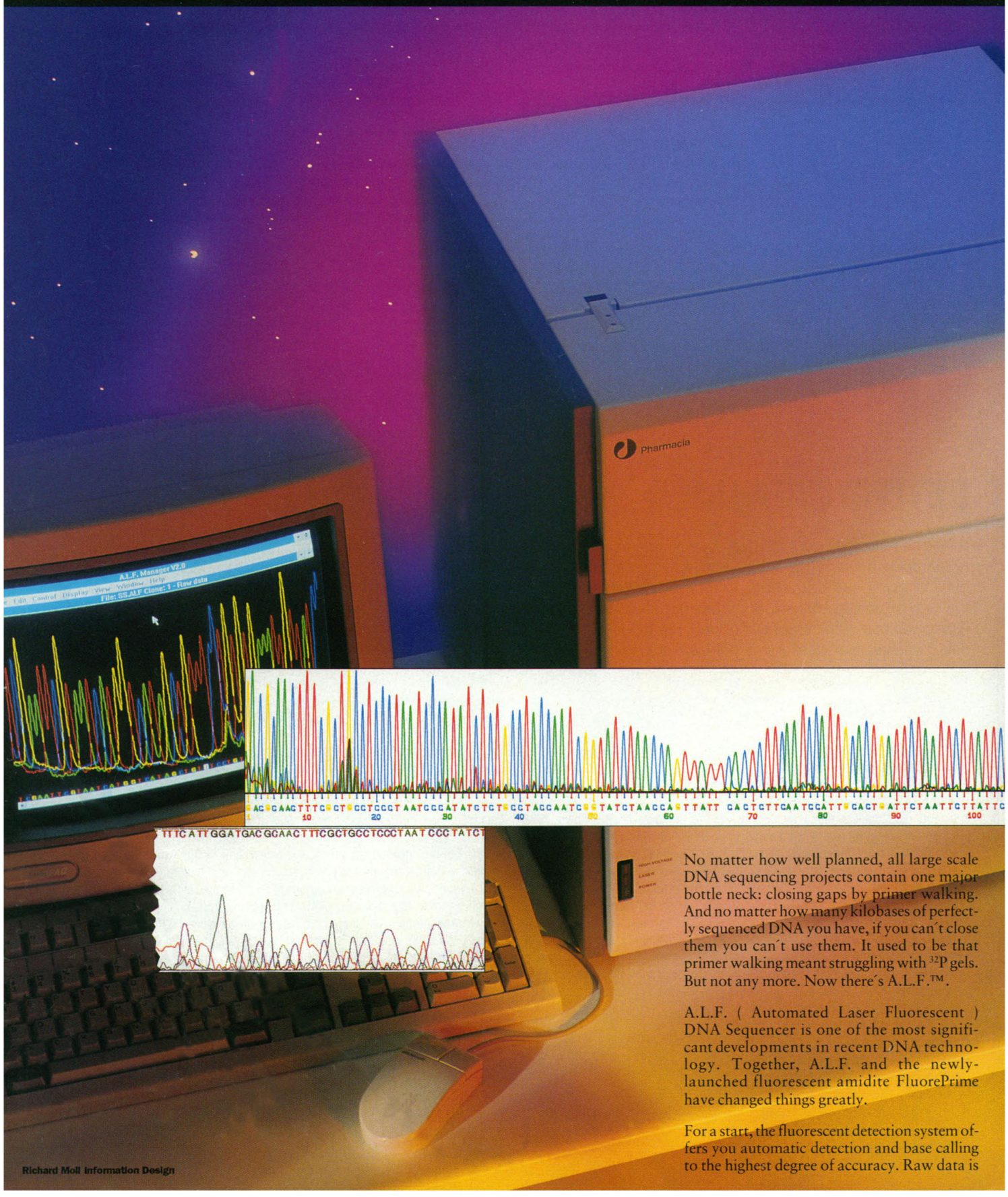

No matter how well planned, all large scale DNA sequencing projects contain one major bottle neck: closing gaps by primer walking. And no matter how many kilobases of perfectly sequenced DNA you have, if you can´t close them you can´t use them. It used to be that primer walking meant struggling with ^{32}P gels. But not any more. Now there´s A.L.F.™.

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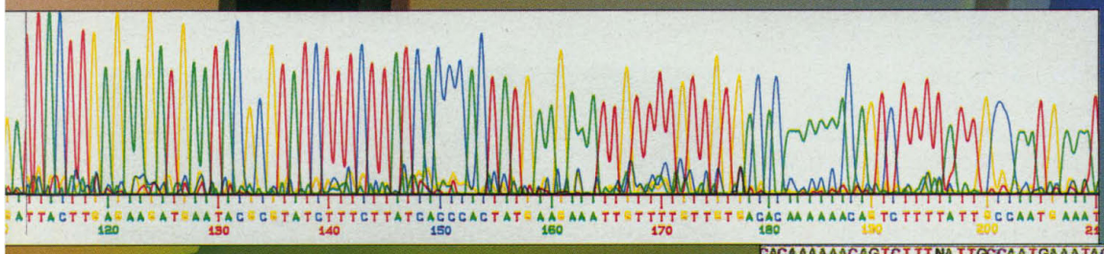
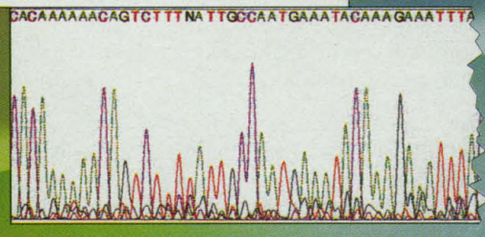
Richard Moll Information Design

that is the first thing"

The graph below shows an example of closure in a 40 Kb stretch of DNA, as part of the *C.elegans* sequencing project, by primer walking using A.L.F. and FluorePrime. (Hawkins, T. L. and Sulston, J. E. (1990) Dec. *Technique* page 307).





easily accessible, so you can always check how it would look "on an autoradiograph".

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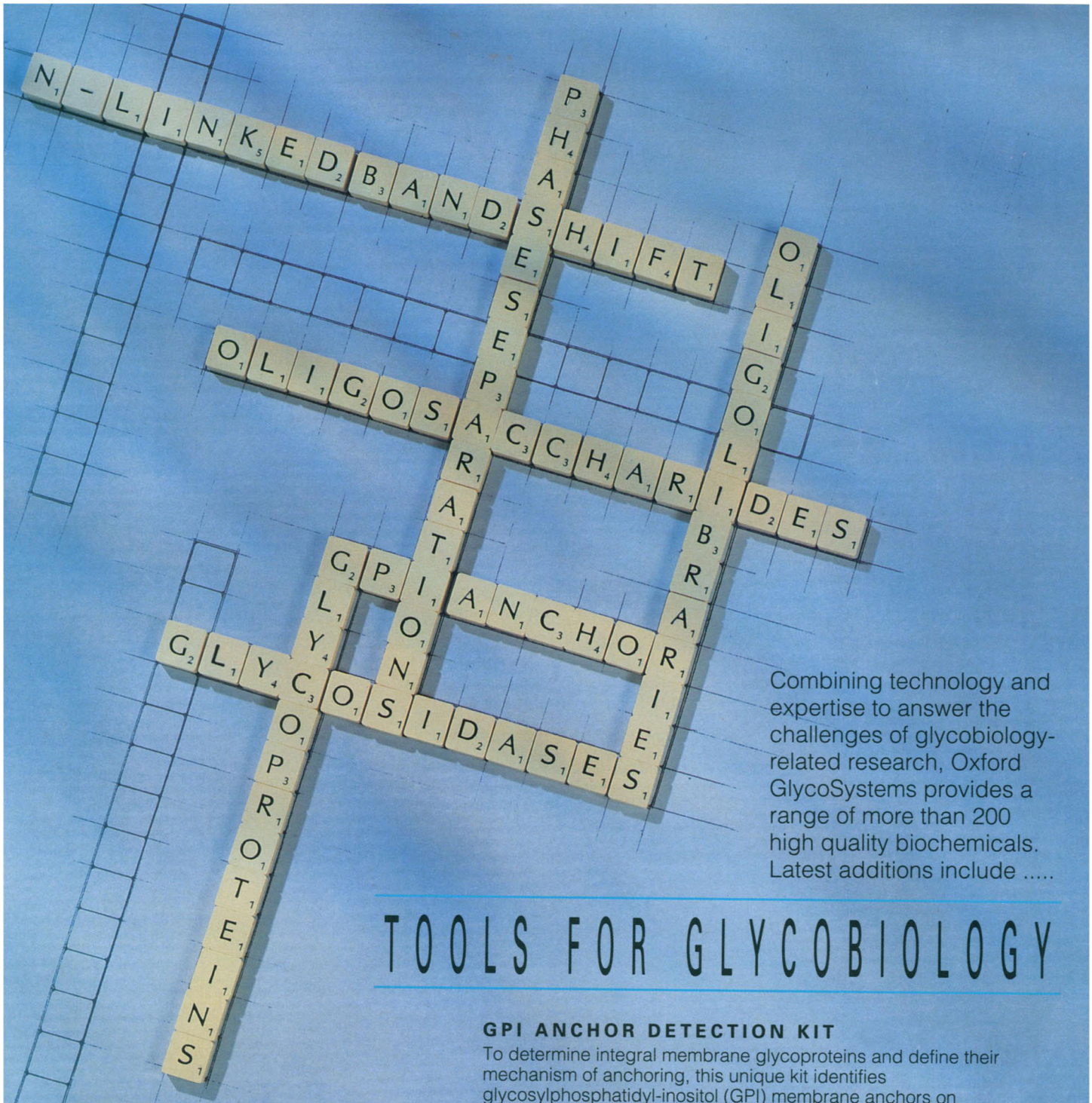

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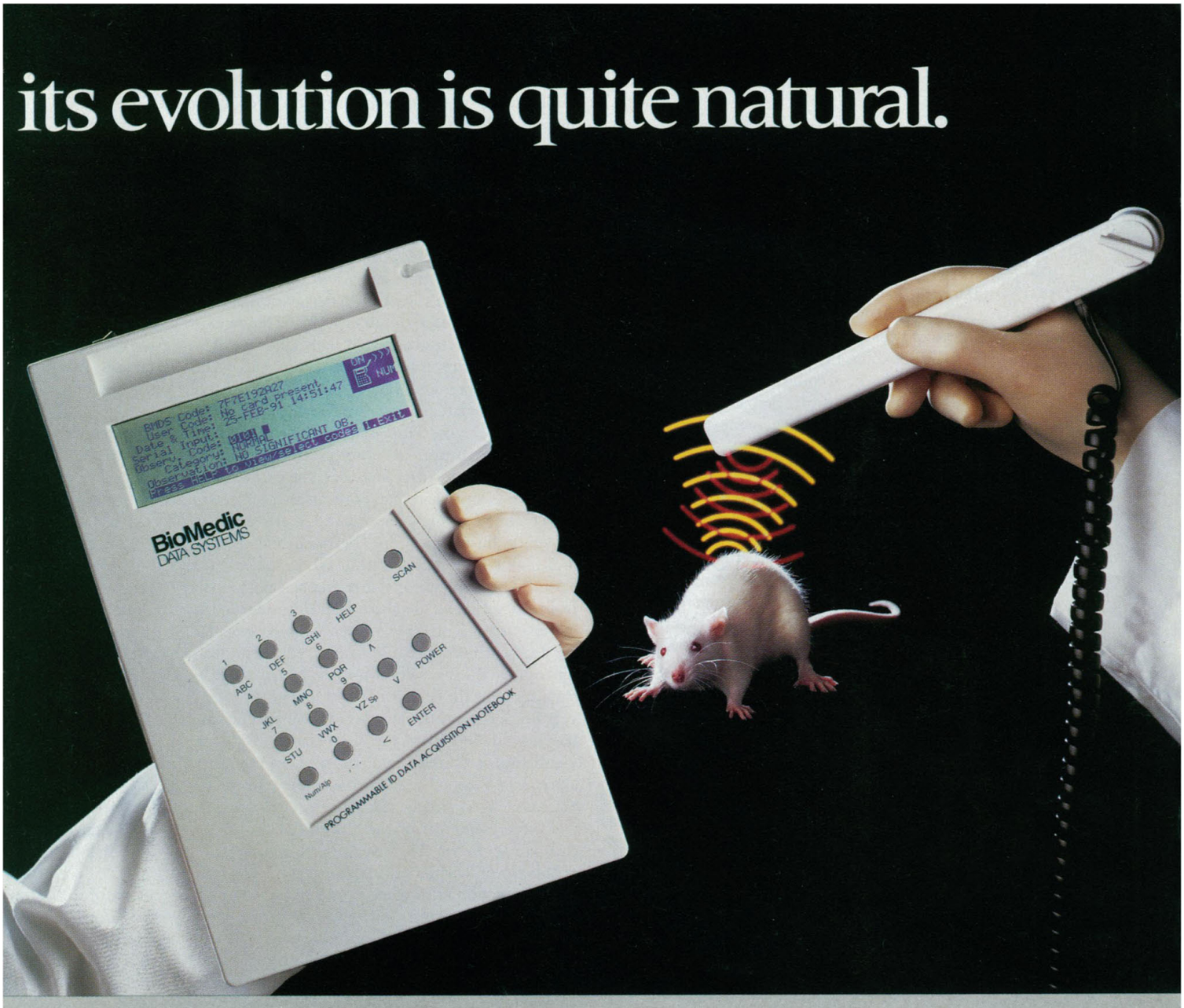
its evolution is quite natural.



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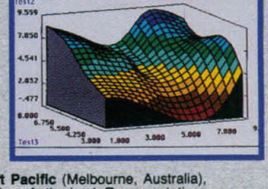

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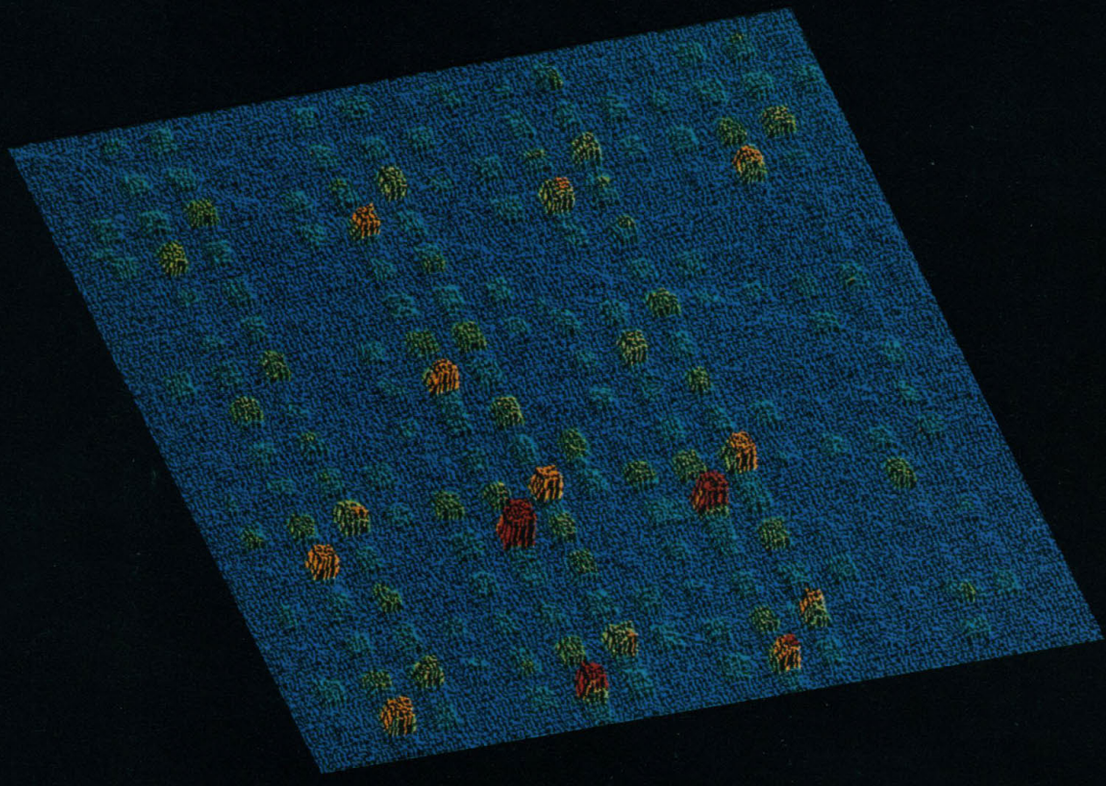

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University of California, Los Angeles, CA
Fotis C. Kafatos, Inga Sidén-Kiamos, Christos Louis, Charalambos Savakis
Research Center of Crete, Heraklion, Crete, Greece

Reviewer

Gerald M. Rubin
University of California, Berkley, CA

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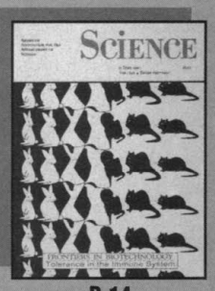

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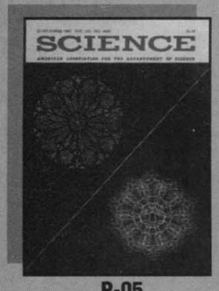

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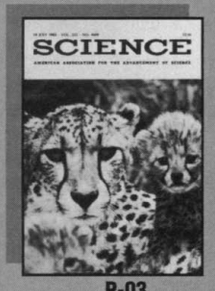

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The Division of Cancer Etiology

National Cancer Institute

Announces To the Scientific Community The Availability of the Following Resources/Services For Cancer Related Research As Noted Below:

Biological Resources

■ Cell Culture Identification Service. Using Isozyme Analysis, Immunofluorescence and Karyotypic Analysis (Chromosome Banding).

Contact: Dr. Ward Peterson
Children's Hospital of Michigan
3901 Beaubien Boulevard
Detroit, MI 48201
(313) 745-5570

Citing Contract #N01-CP-85645

Cost: $375/Analysis

■ Viruses: Avian, Feline, Murine, and Primate Viruses Produced in vivo and in vitro.

Contact: Alice K. Robison, Ph.D.
BCB Repository
Quality Biotech, Inc.
1667 Davis Street
Camden, NJ 08104
(609) 966-8000
(609) 342-8078 FAX

Citing Contract #N01-CP-15665

Cost: Inquire

■ Human sera from donors with: Malignancies (including nasopharyngeal carcinoma), Non-Malignant Disorders, and Normal Individuals

Contact: Coordinator for Research Resources
Biological Carcinogenesis Branch, DCE, NCI, NIH
Executive Plaza North, Room 540
Bethesda, MD 20892

Cost: Shipping and handling charges only.

■ Goat Antisera Against; Avian, Bovine, Feline, Murine, and Primate Intact Viruses and Viral Proteins; Antibodies to Immunoglobulins for a number of species. Preimmune Sera available for some Virus Antisera.

Contact: Alice K. Robison, Ph.D.
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25.00/5 ml. (Preimmune Sera)
65.00/100 ml. (Immunoglobulins)
(Frozen Material)

■ Monoclonal Antibodies are available with specificities for synthetic peptides representing the amino acid sequences of the left end, right end and active site of the oncogene products of avian and mammalian retroviruses. Blocking peptides are also available, as are a limited number of cell lines producing the monoclonal antibodies.

Contact: Alice K. Robison, Ph.D.
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Citing Contract #N01-CP-15665

Cost: Peptides —$25.00/mg.
Ascites Fluid — 45.00/ml.
Cell Culture —100.00/culture.

(Plus Shipping and Handling)

■ The Division of Cancer Etiology's Registry of Experimental Cancers announces the availability of 16 different study sets containing histologic slides of rodent tumors. The study sets, with accompanying syllabi, illustrate a variety of spontaneous and induced tumors, chiefly of rats, mice, and mastomys. Each set is available to cancer investigators worldwide, without charge, for up to two months. Requests or inquiries should be addressed to:

Contact: Registry of Experimental Cancers
National Cancer Institute
Building 41, Room D311
NIH, Bethesda, MD 20892
USA

Chemical Resources

■ Analytical resources for the collection, separation, and elucidation of the components of cigarette smoke and cigarette smoke condensates: A contractor with experience in the development of analytical methods for the determination of constituents of cigarette smoke and of specialty instrumentation for inhalation toxicology is available to assist qualified investigators with particular interest in studies on human and animal model exposure to environmental and sidestream smoke. A large inventory of reference experimental cigarettes, Standard Low Yield Reference Cigarettes, and an extensive chemical data base on smoke and smoke condensate components is available.

Contact: Harold E. Seifried, Ph.D.
Chemical and Physical Carcinogenesis Branch DCE, NCI
Executive Plaza North, Room 700
Bethesda, MD 20892
(301) 496-5471

Cost: Inquire

■ Chemical Carcinogen Reference Standard Repository: Reference quantities of over 750 compounds are available. The newest additions are dilute aqueous standards of PAH deoxyguanosine-3′-monophosphates for Randerath ^{32}P post labelling assays. Other classes of available compounds are: fecapentaenes, food mutagens, polynuclear aromatic hydrocarbons (PAH), PAH metabolites, radiolabeled PAH metabolites, nitrogen heterocycles, nitrosamines/nitrosamides, aromatic amines, aromatic amine metabolites, azo/azoxy aromatics, inorganics, nitroaromatics, pesticides, pharmaceuticals, natural products, dyes, dioxins and chlorinated aliphatics. Data sheets provided with the compounds include chemical and physical properties, analytical data, hazards, storage, and handling information. Catalog available upon request.

Contact: Manager, NCI Chemical Carcinogen Repository
Midwest Research Institute
425 Volker Boulevard
Kansas City, MO 64110
(816) 753-7600, Ext. 523

Cost: Subject to chemical class code and quantity (see catalog) plus handling and shipping charges.

Epidemiology Resources

■ The Tumor Virus Epidemiology Repository (TVER) contains sera and other biological samples from more than 13,000 patients and controls obtained in 12 different countries. The TVER was established primarily to support collaborative research on the role of Epstein-Barr virus (EBV) in Burkitt's lymphoma, nasopharyngeal carcinoma, and related diseases.

The TVER is able to adjust its collection to facilitate the development of new collaborative studies. In addition, some samples are available for reagents and independent research. The most extensive collections are serum samples from patients with Burkitt's lymphoma (sera from more than 1,000 patients).

Contact: Dr. Paul H. Levine
Environmental Epidemiology Branch, DCE, NCI, NIH
Executive Plaza North, Room 434
Bethesda, MD 20892
(301) 496-8115

Cost: Free to Collaborating Investigators; Others: Dependent on Processing Time

■ The National Institute of Allergy and Infectious Diseases and the National Cancer Institute have developed a repository of biological specimens from homosexual men. The specimens were collected through contracts with five major U.S. universities for studies of the natural history of acquired immune deficiency syndrome (AIDS).

Information about applying for collaborative use of these specimens is available from the NIAID Project Officer or the NCI Co-Project Officer.

Contact: Chief, Epidemiology Branch, AIDS Program
National Institute of Allergy and Infectious Diseases
CDC Bldg., Room 240
National Institutes of Health
Bethesda, MD 20892

or to Chief
Extramural Programs Branch, EBP
Division of Cancer Etiology, NCI
Executive Plaza North, Room 535
Bethesda, MD 20892

■ Human fibroblast cultures from individuals at high risk of cancer, members of cancer-prone families, and normal family members are available. Collection is historical with unknown viability. Catalog unavailable. Information requests should include potential use of cultures.

Contact: Chief, Family Studies Section, EEB, DCE, NCI, NIH
Executive Plaza North, Room 439
Bethesda, MD 20892
(301) 496-4375

Cost: Free to collaborating investigators
Others: [illegible]

■ The National Cancer Institute has available the Animal Morbidity/Mortality Survey of Colleges of Veterinary Medicine in North America (also known as the Veterinary Medical Data Program). This unique registry of veterinary medical information represents patient data on animals seen at collaborating veterinary teaching facilities; 3 [illegible] episodes have been abstracted and computerized in a standardized record format. Disease information is coded using the scheme of the Standard Nomenclature of Veterinary Disease and Operations. The computer tapes will be made available upon request.

Contact: Dr. Howard M. Hayes
Environmental Epidemiology Branch
Epidemiology and Biostatistics Program
Division of Cancer Etiology
Executive Plaza North, Room 443
Bethesda, MD 20892
(301) 496-1691

Cost: Inquire

■ The Epidemiology and Biostatistics Program of the National Cancer Institute has developed the Observed versus Expected (O/E) software system which calculates: (1) the number of observed events (e.g. cancer cases or deaths) in a study group at risk; (2) the number of expected events in a study group based on the rate of occurrence in some standard or referent population; (3) the ratio of observed to expected events; and (4) the significance of this ratio. The system is user friendly and capable of executing a series of calculations by different variables such as age, time group, date of exposure, age at date of exposure, duration of exposure, year relative to entry and cause of event. The O/E System provides tables by race, sex and user defined variables, allows user defined latency intervals and accepts standard or user prepared rates. O/E is written in COBOL and is exportable to most mainframes.

Contact: Ruth Wolfson
Epidemiology and Biostatistics Program
Division of Cancer Etiology, NCI
Executive Plaza North, Room 531
Bethesda, MD 20892
(301) 496-1606

Cost: Free to investigators interested in epidemiologic research.

Environmental Cancer

■ NCI's Chemical Carcinogenesis Research Information System (CCRIS) is available online through the National Library of Medicine's Toxicology Data Network (TOXNET) system. Through an interagency agreement between NCI and NLM, the CCRIS database has been built and will be maintained and updated as one of TOXNET's sponsored databases in the broad areas of chemistry, toxicology, and hazardous waste information. The CCRIS database contains evaluated data and information on carcinogens, mutagens, tumor promotors, cocarcinogens, metabolites of carcinogens, and carcinogen inhibitors derived from published review articles, ongoing current awareness survey of primary literature, NCI/NTP's short- and long-term bioassay studies, the IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Man, and special studies and reports.

Contact: Dr. Thomas P. Cameron
Office of the Director
Division of Cancer Etiology
National Cancer Institute
Executive Plaza North, Room 712
Bethesda, MD 20892
(301) 496-1625

Cost: Inquire

■ The Special Assistant for Environmental Cancer, Office of the Director, announces the availability of a limited number of copies of the following publications, which have been prepared under contract to NCI:

Survey of Compounds Which Have Been Tested for Carcinogenic Activity, PHS-149, 1987-1988

And Proceedings of the Fourth NCI/EPA/NIOSH Collaborative Workshop: Progress on Joint Environmental and Occupational Cancer Studies, 1986

Contact: Ms. I.C. Blackwood
Office of the Director
Division of Cancer Etiology
National Cancer Institute
Executive Plaza North, Room 712
Bethesda, MD 20892
(301) 496-1625

Cost: Free to investigators interested in environmental cancer.

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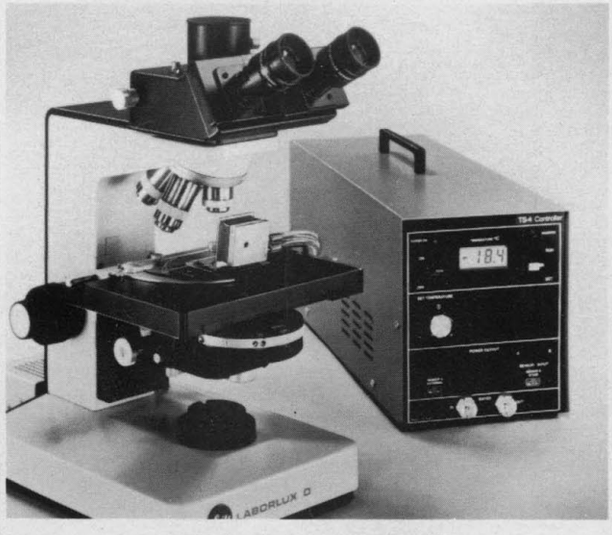

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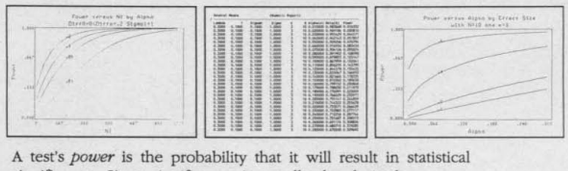

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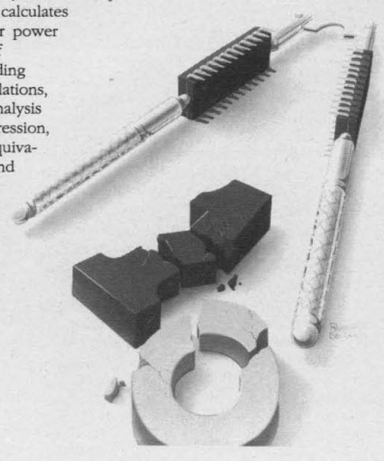

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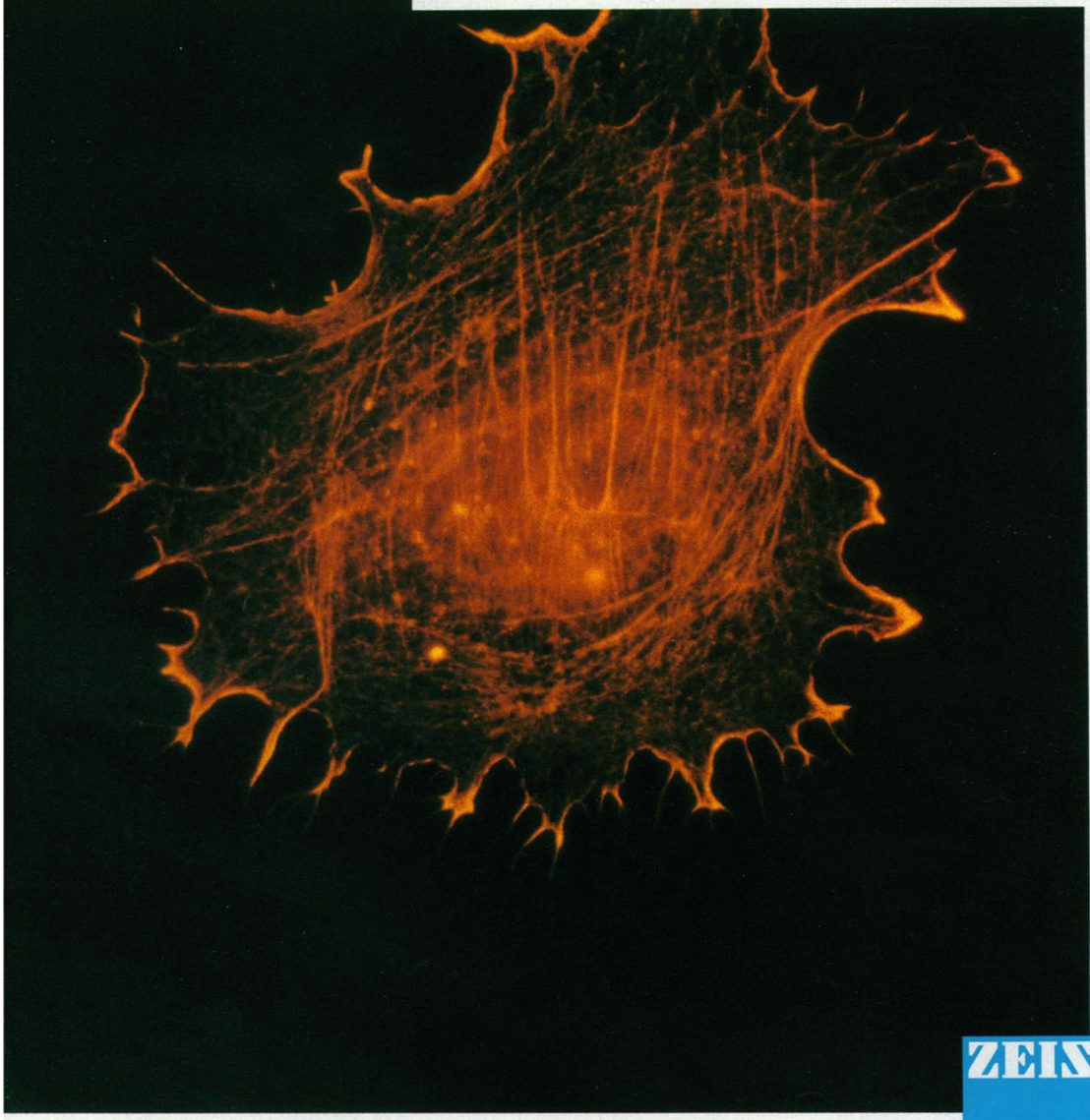

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Gordon Research Conferences

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Chemotherapy of AIDS

Casa Sirena Resort

J. S. Driscoll, chair; J. C. Martin, vice chair

16–20 March

M. Rosenberg, discussion leader

J. C. Martin, "Viruses and antiviral drug design."

B. Cullen, "Biology of HIV and potential HIV gene targets."

D. Rich, "HIV protease inhibitors. Past, present and future designs."

D. Henry, discussion leader

R. Babine, "The use of HIV-1 protease structure in inhibitor design."

Y. Martin, "Beyond molecular graphics: Strategies for computer design of bioactive molecules."

H. Mitsuya, discussion leader

H. Mitsuya, "Strategies for the development of antiviral drugs against AIDS."

L. Rabin, "Preclinical evaluation of antivirals in the SCID-hu mouse."

D. Richman, "Phenotypic and genotypic analysis of HIV-1 drug resistance."

M. Rosenberg, discussion leader

R. Sweet, "Molecular detailing of the HIV binding site on CD4."

B. Larder, "HIV RT and drug resistance."

D. Johns, discussion leader

E. Prisbe, "4-substituted thymidine analogues."

E. W. Taylor, "Structural features underlying the activity of anti-HIV nucleosides."

Y-C. Cheng, "The biochemical pharmacology of anti-HIV nucleosides."

D. Hoth, discussion leader

L. Corey, "The clinical virology of HIV."

C. Schooley, "Implications for drug development of the clinical immunopathogenesis of HIV."

E. De Clercq, discussion leader

P. Janssen, "TIBO and its analogues."

M. Baba, "HEPT derivatives as anti-HIV agents."

M-C. Hsu, "HIV TAT inhibitors."

G. Elion, discussion leader

C. Hansch, "Applicability of QSAR to the AIDS problem."

D. Bolognesi, discussion leader

P. Berman, "Development of subunit HIV vaccines."

M. Gardner, "SIV and FIV vaccines: An update."

L. Corey, "Human HIV clinical trials. Are there targets for immunogenicity?"

Poster sessions: J. C. Martin, organizer. Those who wish to submit posters for consideration should send an abstract before 15 December to John C. Martin, Gilead Sciences Inc., 344 Lakeside Drive, Foster City, CA 94404. Telephone: 415-574-3000; FAX: 415-578-9264.

Angiotensin

Casa Sirena Resort

J. G. Douglas, chair; F. Ganong, vice chair

10–14 February

Angiotensin II effects on growth, differentiation and cell lineage: W. Hsueh, discussion leader

S. Schwartz, "Vascular smooth muscle effects in angiotensin II on growth."

V. Dzau, "Interaction of autocrine growth factors in angiotensin-mediated hypertrophy and mitogenesis in smooth muscle."

Novel aspects of angiotensin II–induced signal transduction: K. J. Catt, discussion leader

S. G. Rhee, "Regulation of phospholipase isozymes by hormones and growth factors."

L. Hundyady, "Control of calcium influx mechanisms by angiotensin II."

T. Force, "The role of tyrosine phosphorylation in novel signal transduction pathways of the vasoactive peptides."

Molecular biology of vasoactive receptor subtypes: T. Iangami, discussion leader

T. J. Murphy, "Angiotensin II receptor subtypes."

R. Freedman, K. Jarnigan, "Cloning of beta 2 bradykinin receptors and identification of the bradykinin binding site."

Interaction of receptors, G-proteins and phospholipase C: J. C. Garrison, discussion leader

T. K. Harden, "G-protein regulation of phospholipase C."

A. V. Smirka, "Regulation of phospholipase C by Gq."

D. Wu, "Activation of phospholipase C isozymes by the alpha subunits of the Gq family."

Pharmacology of angiotensin II receptor subtypes: A. T. Chu, discussion leader

S. P. Bottari, "Signal transduction linked to the AT_2 receptors."

C. Sumners, "Angiotensin II receptor subtypes in brain cells: Modulation of ionic currents and intracellular messages."

Cytochrome P-450–dependent arachidonic acid metabolism: Its role in signaling: D. Koop, discussion leader

B. Campbell, "Cytochrome P-450 metabolites of arachidonic acid" potential regulation of vascular tone and adrenal steroidogenesis."

M. L. Schwartzman, "Hormonal regulation of P-450–dependent arachidonic μ-hydroxylase activity in kidney tubules."

Central actions of angiotensin II: F. Ganong, discussion leader

M. K. Steele, "Situation-specific functions of the brain angiotensin II system regarding LH and prolactin secretion."

F. A. O. Mendelsohn, "Actions of angiotensin in stimulating striatum dopamine release."

Angiotensin II involvement in autocrine function with emphasis on the kidney: L. G. Navar, discussion leader

R. Carey, "Renal interstitial angiotensin II."

J. Inglefinger, "Cell biology of angiotensinogen in the proximal tubule."

Carotenoids, Chemistry and Biology of

Casa Sirena Resort

N. I. Krinsky, chair; J. A. Olson, vice chair

9–13 March

Carotenoids in photosynthesis

T. Moore, "Carotenoids in model photosynthetic systems."

H. Frank, "Structure and photochemistry of carotenoids in photosynthetic bacteria."

B. Demmig-Adams, "Zeaxanthin function in photosynthetic organisms."

Chemistry of carotenoids

H. Pfander, "Synthesis of biologically active carotenoids."

J. Paust, "Synthesis of commercial carotenoids."

Antioxidant properties of carotenoids

A. Tappel, "Carotenoids as in vivo antioxidants."

L. Packer, "Carotenoid reactions with radical sources."

G. Burton, "Pro-oxidant and anti-oxidant properties of carotenoids."

Biological actions of carotenoids

J. Bertram, "Carotenoids and gap junctional communication."

Y. Tomita, "Carotenoids as immunomodulating agents."

Carotenoid absorption, transport, and tissue distribution

R. Parker, "Carotenoids in human adipose tissue."

J. Erdman, "Carotenoids absorption in ferrets and pre-ruminant calves."

G. Handelman, "Polar and non-polar carotenoids in human plasma."

Carotenoid biosynthesis

J. Hearst, "Gene clusters for carotenoid biosynthesis."

N. Misawa, "A single gene for multiple steps in carotenoid biosynthesis."

P. Scolnik, "Genetics and enzymology of plant genes for early steps of the carotenoid biosynthesis pathway."

Carontenoid metabolism

J. Olson, "Central cleavage mechanism for carotenoid metabolism."

N. Krinsky, "Excentric cleavage mechanism(s) for carotenoid metabolism."

K. Schiedt, "Function and metabolism of carotenoids in various species."

Biology of carotenoids

G. Britton, "Biology of carotenoids: A challenging field of chemistry."

Carotenoids in health and disease

R. Ziegler, "Studies of carotenoids and cancer: Recent research and current controversies."

R. Brandt, "Effects of carotenoids in tobacco users."

D. Albers, "Clinical studies on carotenoids."

Composites

Doubletree Hotel

R. S. Porter, chair; A. F. Yee, vice chair

13–17 January

K. L. DeVries, discussion leader

R. L. Thomas, "On thermal wave imaging of composites."

J. Shaefer, "Magic-angle spinning NMR analysis of polymer interfaces."

R. L. Powell, discussion leader

R. Parnas, "Non-destructive evaluation of composites."

D. C. Bonner, discussion leader

V. K. Stokes, "Mechanical properties of industrial composites."

J. Muzzy, "Flexible preform manufacturing by powder fusion coating."

A. T. DiBenedetto, discussion leader

L. Monette, M. P. Anderson, G. S. Guest, "On the meaning of the critical length concept in composites."

H. D. Wagner, "Interface and fracture studies by means of single fiber microcomposites."

A. F. Yee, discussion leader

Short presentation speakers

J. E. Fitzgerald, discussion leader

J. G. Williams, "Interpretation of mode I, mode II and mixed mode toughness data for laminates."

S. S. Sternstein, "Characterization of compression strength for continuous fiber composites."

S. Corley, discussion leader

E. George, "New matrix polyketone compositions for composites."

N. H. Sung, C. S. Sung, "Fluorescence characterization of composites."

A. E. Zachariades, discussion leader

D. Prevorsek, "Ballistic mechanics of viscoelastic composites."

D. H. Grande, discussion leader

L. Drzal, "Relations between fiber-matrix adhesion and composite mechanics."

J. M. O'Reilly, discussion leader

F. W. Harris, S. Z. D. Cheng, "Polyimide matrix composites."

H. G. Kia, discussion leader

S. Dinda, "Composites for automotive applications."

A. F. Yee, discussion leader

A. Y. Malkin, "Rheokinetics for oligo-

The author, director of the Gordon Research Conferences, is professor emeritus of chemistry, University of Rhode Island, Kingston 02281–0801.

mer curing in composites."

J. A. Nairn, "Micromechanics of damage analysis of transverse ply cracking and transverse ply crack–induced delamination."

J. M. Kenny, "Optimization and control of the autoclave processing of thermoset matrix composites."

Dynamics of Macromolecular and Polyelectrolyte Solutions

Casa Sirena Resort

P. N. Pusey, chair; R. Pecora, vice chair

17–21 February

Synthetic polymers: T. P. Lodge, discussion leader

D. Richter, "Polymer motion in dense systems."

D. J. Pine, "The structure of polymer solutions under shear flow."

G. H. Frederickson, "Block and random copolymers."

P. Stepanek, "Critical dynamics of polymer blends."

C. C. Han, "Effect of shear on the statics and kinetics of phase behavior of polymer mixtures."

Amphiphilic systems: L. J. Magid, discussion leader

J. Penfold, "The use of specular neutron reflection to study the structure of surfactant layers."

D. Roux, "Static and dynamic properties of the sponge phase."

D. J. Durian, "Multiple light scattering studies of foam."

Liquid crystals/rods: N. A. Clark, discussion leader

R. Klein, "Colloidal dispersions of charged rods" or "Structure and dynamics of polyelectrolytes."

R. B. Meyers, "X-ray scattering from polymer nematic liquid crystals" or "Studies of molecular aggregate liquid crystals."

Colloids: P. M. Chaikin, W. van Megen, discussion leaders

K. Schatzel, "Crystallization kinetics of hard sphere colloids."

A. P. Gast, "Crystallization instabilities in colloidal suspensions and protein monolayers."

N. M. Lawandy, "Consequences of photonic bandgaps in colloidal crystals."

R. Piazza, "Dynamic light scattering by concentrated suspensions of optically anisotropic particles."

B. J. Ackerson, "Microstructure and rheology in colloidal particle suspensions."

Gels: B. Chu, discussion leader

J. Bastide, "Experimental evidence of inhomogeneous swelling and uniaxial deformation of polymer gels."

J. G. H. Joosten, "Dynamic and static light scattering by polymer gels."

D. A. Hoagland, "Using electrophoresis to study polymer transport in gels and other porous media."

General: P. N. Pusey, discussion leader

D. Frenkel, "Computer simulations of complex fluids."

M. Fixman, "Themes from the posters."

Biopolymers: H. Yu, discussion leader

R. W. Pastor, "Frictional properties of biopolymers: Modeling with the oseen tensor."

R. Pecora, "Dynamics of DNA fragments: Dilute and semidilute solutions."

Electrochemistry

Doubletree Hotel

R. M. Wightman, chair; A. Diaz, vice chair

20–24 January

M. A. Fox, "Polymeric arrays for catalytic redox chemistry."

C. A. Amatore, "One-electron and two-electron mechanisms in the catalysis of the reductive homo- and heterocoupling of organic halides by transition metal complexes."

R. A. Marcus, "Electron transfer across liquid-liquid and other interfaces."

J. Hupp, "New kinetic and structural approaches to intramolecular and interfascial electron transfer."

H. S. White, "Atomic force and scanning tunneling microscopy of electroactive films."

R. Colton, "Probing the surface forces of materials using atomic force microscopy."

M. E. Meyerhoff, "Novel anion and gas selective potentiometric sensors."

D. J. Harrison, "Electrochemical sensors and materials science: Probing inside chemically sensitive polymer membranes."

D. Rollison, "Electric field–enhanced catalysis."

K. M. Kadish, "C_{60} and C_{70} electrochemistry, fullerene ions, their reactions, their salts."

W. G. Kuhr, "Enzyme-modified, carbon fiber electrodes for in vivo use."

B. Shaw, "New materials for electroanalysis."

A. A. Gewirth, "Atomic force microscope studies of electrochemical processes."

J. Redepenning, "Influence of ion-exchange processes on electrode potentials measured for polymer-modified electrodes."

D. Corrigan, "Nickel hydroxide electrochemistry and electric vehicles."

D. Rauh, "Recent developments in electrochroism."

R. N. Adams, "Tuning carbon-fiber electrodes for in vivo voltammetry."

D. C. Johnson, "Electrocatalysis of anodic oxygen-transfer reactions."

Electronic Materials

Casa Sirena Resort

R. S. Williams, chair; F. A. Houle, vice chair

2–6 March

Chemical vapor deposition: J. E. Green, discussion leader

S. M. Gates, "Mechanisms of Si CVD growth."

P. Hess, "Photo-assisted CVD growth."

L. H. Dubois, "Growth of metallic thin films by MOCVD."

New materials: Superconducting semiconductors: R. P. Messmer, discussion leader

R. B. Kaner, "Alkali-fulleride (C_{60}) superconductors."

E. R. Weber, "Superconductivity in GaAs and other III-V compound semiconductors."

Surface chemistry: D. E. Apnes, discussion leader

J. T. Yates, "Molecular decomposition leading to doping of Si."

H. Metiu, "Simulations of island growth and segregation at steps on semiconductor surfaces."

J. R. Creighton, "The surface chemistry of GaAs ALE."

Precursors: H. D. Kaesz, discussion leader

A. H. Cowley, "Novel precursors for CVD growth."

G. B. Stringfellow, "CVD growth with novel precursors."

Plasma deposition and etching: L. A. DeLouise, discussion leader

P. Ho, "Plasma processes in Si growth."

H. H. Sawin, "Surface kinetics of plasma etching: Simultaneous CF_2, F, and ion beam etching of Si and SiO_2."

A. Scherer, "Resolution limits of ion-beam etching."

Atomic-scale etching: discussion leader TBA

Y. Aoyagi, "Digital etching of GaAs."

M. Aono, "Etching of nanometer-scale features on Si with a STM."

Chemistry of dry etching: J. A. Yarmoff, discussion leader

T. Engel, "Mechanisms of Si etching."

E. A. Carter, "Theory of Si etching."

H. F. Winters, "Effects of doping on semiconductor etching."

Important issues in chemistry of electronic materials: F. A. Houle, discussion leader

E. A. Irene, "Are chemists passivated by electronic materials or vice versa?"

M. E. Gross, "Future of chemistry in electronic materials."

Open discussion: New frontiers for electronic materials research: D. L. Nelson, discussion leader

Isotopes in the Physical and Life Sciences

Doubletree Hotel

J. L. Hogg, chair; M. Saunders, vice chair

9–13 March

A. J. Kresge, discussion leader

C. J. Murray, "Bioorganic studies of proton and hydride transfer reactions."

J. F. Marlier, "Heavy atom isotope effects on ester hydrolysis."

R. L. Schowen, "Bacterial lactate dehydrogenase: Kinetic isotope effects as mechanistic indicators in catalysis and regulation."

M. Wolfsberg, discussion leader

K. N. Houk, "Calculations of isotope effects of organic reactions from quantum mechanics: A tool to distinguish mechanisms."

D. G. Trular, "Kinetic isotope effects for organic reactions by variational transition state theory with semiclassical transmission coefficients."

J. S. Blanchard, discussion leader

P. F. Cook, "Isotope effects in the NAD-malic enzyme reaction."

P. F. Fitzpatrick, "Isotope effects on flavoprotein oxidases."

D. M. Kiick, "Commitments to catalysis affect the degree of curvation in the proton inventories of the kinetic parameters for enzyme-catalyzed reactions."

V. J. Shiner, Jr., discussion leader

J. J. Gajewski, "Pericycle transition state structure from deuterium isotope effects."

E. A. Halevi, "[2+2]-cycloadditions: Symmetry, concertedness and secondary isotope effects."

F. M. Raushel, discussion leader

T. D. Meek, "Isotopic probes of the mechanism of HIV-1 protease and other aspartic proteases."

R. L. Stein, "Solvent and secondary kinetic isotope effects as probes of protease catalysis and inhibition."

V. L. Schramm, "Trypanosome metabolism: Kinetic isotope effects, transition states, and logical inhibitor design."

M. Saunders, discussion leader

J. E. Baldwin, "Isomerizations of isotopically labeled hydrocarbons."

G. R. Stevenson, "The effect of isotopic substitution upon relative solution electron affinity."

V. E. Anderson, discussion leader

M. L. Sinnott, "Multiple kinetic isotope effect determinations of transition state structure in enzymic and nonenzymic glycosyl transfer reactions."

J. F. Kirsch, "Intrinsic kinetic isotope effects revealed by genetically engineered changes in rate determining step of aspartate aminotransferase."

B. V. Plapp, "Solvent isotope effects with alcohol dehydrogenases."

W. H. Saunders, Jr., discussion leader

D. A. Forsyth, "NMR studies of deuterated amines."

W. W. Cleland, discussion leader

G. Tian, "Oxygen-18 isotope effects and transition state perturbations as probes of the mechanism of oxygen activation in the dopamine β-hydroxylase catalyzed reaction."

D. M. Quinn, "Isotope effects for nontraditional serine esterases."

W. B. Knight, "The use of isotopes to probe the mechanism of inhibition of human leukocyte elastase by β-lactams."

Marine Natural Products

Doubletree Hotel

C. M. Ireland, chair; R. Andersen, vice chair

17–21 February

R. Andersen, discussion leader

J. Clardy, "Structural studies of natural products."

M. R. Boyd, "Revitalization of natural products drug discovery research

and development programs at the NCI."

P. Crews, "The use of the enzyme cancer model as a tool to discover novel sponge metabolites."

D. J. Faulkner, discussion leader

J. Pawlik, "Chemistry, physics and behavior: The settlement of marine invertebrate larvae."

B. K. Carté, "Marine natural products as a source of novel pharmacological agents."

R. E. Moore, discussion leader

W. H. Fenical, "Marine bacteria: Symbiotic relationships and the production of bioactive metabolites."

T. Shioiri, "Synthesis of some marine natural products bearing unusual structures."

B. Olivera, "Conotoxins."

J. B. Gloer, discussion leader

L. Minale, "Chemical constituents from new caledonian deep-water species."

T. Yasumoto, "Antifungal substances from marine dinoflagellates."

F. J. Schmitz, discussion leader

W. Gerwick, "Structure and biosynthesis of marine oxylipins."

A-M. Casazza, "Mechanism-based screens for anti-cancer drug discovery."

C. Holmes, "Okadaic acid and related marine toxins; potent new probes for the study of eukaryotic cellular regulation."

Y. Shimizu, discussion leader

A. Butler, "Marine bio-inorganic chemistry: Vanadium bromoperoxidase form marine algae and novel siderophores from marine bacteria."

W. M. Maiese, discussion leader

S. Pomponi, "Sponge cell culture and the production of bioactive metabolites: Status and potential."

E. Hamel, "New anti-mitotics derived from marine animals."

T. Meeks, "The HIV-1 protease as a target for rationale design of AIDS therapeutics."

C. M. Ireland, discussion leader

P. J. Scheuer, "Cyanides and isocyanides, occurrence and origin."

T. F. Molinski, discussion leader

C. Djerassi, "A swan song."

J. Kobayashi, "Okinawan marine natural products from Sapporo."

Metals in Biology

Doubletree Hotel

J. Coleman, chair; E. Stiefel, vice chair

27–31 January

Metal ions and the mechanism of gene expression: D. Hamer, discussion leader

Structure of metal-containing transcription factors: J. Berg, discussion leader

Iron transport and storage and their genetic control: P. Aisen, discussion leader

Metal ions in oxygen and peroxide activation: J. Dawson, discussion leader

Structure and mechanism of zinc metalloenzymes: D. Christianson, discussion leader

Structure and function of copper proteins: E. Adman, discussion leader

Structure and function of metallo-sulfur sites: E. Stiefel, discussion leader

Metal ion–mediated biosynthesis of natural products: J. Groves, discussion leader

Zinc and all that . . .: B. L. Vallee, discussion leader

Molecular Cytogenetics

Doubletree Hotel

J. W. Gray, chair; M. van der Ploeg, vice chair

2–6 March

M. van der Ploeg, discussion leader

"In situ hybridization to DNA and RNA."

"Nucleic acid sequence detection by in situ extension of bound primers."

H. Tanke, discussion leader

"Computer-assisted microscopy."

"Confocal microscopy."

M. Ferguson-Smith, discussion leader

"Repeat sequence probes: Biology and chromosome specificity."

"Whole chromosome probes: Construction and characterization."

"Unique sequence probes for detection of specific aberrations."

D. Ward, discussion leader

"Metaphase mapping."

"Interphase mapping."

D. Pinkel, discussion leader

"Genetic evolution in human malignancies."

"Aneuploidy analysis in genetic disease diagnosis and study."

"Structural aberrations analysis in tumor diagnosis."

M. Le Beau, discussion leader

"Correlation between genotype and phenotype."

"Residual disease detection."

D. Jovin, discussion leader

"Chromosomal organization of the interphase nucleus."

"Messenger RNA production, splicing, and transport."

"Spatial and temporal analysis of the replication of specific regions of the genome."

M. Mendelsohn, discussion leader

"Aneuploidy analysis in genetic toxicology."

"Structural aberration analysis in biological dosimetry."

J. W. Gray, discussion leader

"Design of an optimal multi-locus hybridization probe for automated cytogenetic analysis."

"Efficient selection of probes for multi-locus tumor diagnosis in interphase nuclei."

Neuroendocrinimmunology

Casa Sirena Resort

R. M. MacLeod, chair; A. E. Panerai, vice chair

23–27 March

R. M. MacLeod, discussion leader

R. M. MacLeod, "Immunopeptides in the neuroendocrine system."

B. Spangelo, "Production and function of IL-6 in the pituitary."

C. Rivier, "Effect of cytokines on the endocrine system."

F. Haour, "Interleukin receptors in brain and neuroendocrine system."

B. S. McEwen, discussion leader

B. S. McEwen, "Immunopeptides and glucocorticoids in the neuroendocrine system."

S. M. McCann, "The control of hypothalamic pituitary function by mono- and cytokines."

S. Solomon, "Immune system peptides: The corticostatins and granulins."

S. L. Hauser, discussion leader

S. L. Hauser, "Immunopeptides in the nervous system."

P. Ricciardi-Castagnol, "Constitutive and inducible functions of microglia cells."

J. Merrill, "Cytokines in CNS disease."

P. Nistico, "Electroencephalic spectrum power effect of cytokines injected in specific areas of the brain."

A. Goldstein, discussion leader

A. Goldstein, "Thymic hormones."

M. Dardenne, "Control of thymic epithelium by pituitary hormones."

V. Geenen, "The cryptocrine model of thymic cell to cell signaling in developmental immunology."

J. E. Blalock, discussion leader

J. E. Blalock, "Neuropeptides in the immune system."

D. Felton, "Neurotransmitter signaling of cells of the immune system."

E. Goetzl, "Lymphocyte receptors for neuropeptides."

P. Sacerdote, "Cytokines and neuropeptides in human and experimental arthritis."

S. O'Dorsio, discussion leader

S. O'Dorsio, "Neuropeptides in the immune system: Mucosal immunity."

K. Bulloch, "Role of CGRP in the immune system."

D. Payan, "Role of neuropeptides in inflammation."

A. Panerai, discussion leader

A. Panerai, "Neuropeptides in the immune system."

E. De Souza, "Lymphocyte receptors for neuropeptides."

T. Roszman, "Neural-immune interactions signaling pathways."

C. Heijnen, "Modulation of the immune responses by neuropeptides."

B. Rabin, discussion leader

B. Rabin, "Immunopeptides in pathophysiological conditions."

C. Franceschi, "Stress and immune responses during aging."

G. Solomon, "Acute physical and mental stress in immunity in young and old."

E. M. Smith, discussion leader

E. M. Smith, "Action of hormones in immune cells."

B. Marchetti, "The essential role(s) of neuropeptides in immune functioning."

R. Cross, "Neuroendocrine modulation of immunity: GH and IGF-1."

M. B. Prystowsky, "Contribution of PRL to lymphocyte proliferation."

Nondestructive Evaluation

Casa Sirena Resort

R. L. Thomas, chair; J. Bussiere, vice chair

20–24 January

K. Wickramasinge, discussion leader

D. Pohl, "Recent developments in scanning probe microscopies."

W. Kaiser, "Ballistic electron emission spectroscopy."

A. Bard, "Scanning electrochemical microscopy."

K. Wickramasinge, discussion leader

M. Isaacson, "Extreme near-field optical microscopy."

C. Williams, "Scanning capacitance microscopy."

TBA, discussion leader

L. Piche, "Ultrasonic properties of disordered materials: Propagation, diffusion and localization."

R. Addison, "Materials characterization by laser-generated ultrasound."

W. Arnold, "Influence of microstructure on ultrasonic velocity in superalloys: Micromagnetic microstructure multiparameter analysis."

TBA, discussion leader

R. Green, "X-ray topographic imaging with a synchroton source."

D. Burleigh, "Shearography for NDE of large surfaces."

TBA, discussion leader

R. Claus, "Optical fiber sensors for smart material structures."

R. Measures, "Advances towards fiber optic–based smart structures."

R. Rogowsky, "Behavior of fiber modal patterns under stress."

TBA, discussion leader

TBA, speaker

TBA, speaker

W. Winfree, discussion leader

D. Balageas, "Stimulated infrared thermography in nondestructive evaluation of materials and structures."

J. Maclachlan-Spicer, "Time-resolved infrared radiometry for nondestructive characterization of structured materials."

S. Shepard, "Time-resolved IR thermography."

P. K. Kuo, discussion leader

G. Kino, "History and development of the confocal optical microscope."

G. Alers, discussion leader

D. Jiles, "Magnetic inspection techniques for NDE."

K. Kawashima, "NDE with high-frequency EMAT's at room temperature or higher."

L. Swartzendruber, "Utilization of the Barkhausen effect for NDE."

Organic Thin Films

Doubletree Hotel

S. T. Kowel, chair; C. Frank, vice chair

24–28 February

P. Stroeve, discussion leader

H. Mohwald, "Phase transitions and thermal stability of LB films."

J. Als-Nielsen, "Fluid surfaces."

R. Dluhy, "Monolayer IR reflectance

spectroscopy at liquid and solid surfaces."

A. Ulman, discussion leader

J. Calvert, "Deep UV photochemistry and lithography of chemisorbed monolayer films."

H. M. McConnell, "Transient 2-D structures in lipid monolayers."

J. Zasadzinski, discussion leader

M. Klein, "Modeling of interfaces."

M. Tirrell, "Forces between layers of polymeric amphiphiles."

C. Knobler, "Phase transitions in Langmuir monolayers of acids and esters."

J. Swalen, discussion leader

R. Shen, "Second harmonic generation from monolayers."

J. Rabe, "Direct observation of molecular structure and dynamics in self-assembled monolayers by STM."

C. Frank, discussion leader

G. Meredith, "Design, characterization and application of polymeric thin films in nonlinear optics."

M. Hara, "Heteroepitaxial MBE growth of organic ultrathin films studied by STM."

M. Kakimoto, "Nonamphilic polymer LB films via precursor amphiphiles."

J. Schnur, discussion leader

N. Thompson, "Binding kinetics and diffusion of proteins at model membrane surfaces."

D. Needham, "Mechanical and interactive properties of liposome membranes."

J. LeGrange, discussion leader

P. Cladis, "Smectic liquid crystals."

S. Morris, "Freely suspended liquid crystal films."

S. Troian, "Surfactants."

G. Roberts, discussion leader

T. Skotheim, "Conducting LB films."

S. Forrest, "Optical and electronic properties of crystalline organic semiconductor structures grown by organic MBE."

G. Kepler, discussion leader

A. Knoesen, "Electro-optic polymeric etalons."

A. Purvis, "Deflection and focus in liquid crystal films."

C. Adachi, "Electroluminescence of organic films."

Oxygen Radicals in Biology

Doubletree Hotel

J. W. Eaton, chair; D. J. Reed, vice chair

3–7 February

D. J. Reed, discussion leader

J. R. Babson, "Endogenous oxidant stress and cell death."

P. Riley, "Are oxidants involved in cell death."

J. W. Larrick, "Free radicals in tumor necrosis factor–mediated cytotoxicity."

J. Morrow, "Non-enzymatic prostaglandin synthesis."

G. Czapski, discussion leader

S. M. Linn, "Oxidative mechanisms of DNA damage."

R. P. Hebbel, "Oxidant damage to chromatin."

L. J. Marnett, discussion leader

B. Demple, "Oxidative stress genes and proteins—signal transduction."

P. A. Cerutti, "Control of cell growth by oxidants."

K. J. A. Davies, "Oxidant regulation of gene expression."

J. A. Fee, "Metal ion regulation of SOD genes."

W. A. Pryor, discussion leader

W. A. Pryor, "Air-borne oxidants."

J. Dykens, "Oxidative stress in marine organisms."

J. Rifkind, discussion leader

J. M. Carney, "Determinants of age-related brain oxidation and its reversal."

M. D. Scott, "Accelerated red cell aging by oxidant processes."

R. T. Dean, "Oxidative correlation of the processes of aging."

S. P. Wolff, "Oxidation, glycation, and cell aging."

S. D. Aust, discussion leader

E. Hall, "Lazaroids—chemistry and therapeutic action."

C. E. Thomas, "Lipid oxidation in disease states."

S. R. Meshnick, discussion leader

C. C. Winterbourn, "Oxidant mechanisms of drug action."

J. H. Doroshow, "Enzymatic protection against cytotoxicity of anticancer quinones."

S. R. Meshnick, "Oxidant antimalarial drugs."

M. A. Marletta, discussion leader

M. A. Marletta, "Biochemistry of nitric oxide (NO) formation."

J. B. Hibbs, Jr., "Cytocidal actions of nitric oxide."

J. S. Beckman, "Role of nitric oxide in superoxide-dependent pathology."

A. Slungaard, "Cytotoxicity of eosinophil peroxidase."

Peptides, Chemistry and Biology of

Doubletree Hotel

P. W. Schiller, chair; M. C. Fishman, vice chair

10–14 February

Peptide synthesis and analysis

New methods in designing amino acids and peptides: V. J. Hruby, discussion leader

J. A. Wells, "Enzymes designed for the synthesis of peptide bonds in aqueous solution."

R. M. Caprioli, "Analysis of peptides by mass spectrometry: Recent developments and applications."

TBA

Conformational aspects of peptide-macromolecule interactions

Multiple binding modes: Detection and pharmacological implications: G. R. Marshall, discussion leader

M. Walkinshaw, "Structural studies on the interaction of immunophilins with peptide and peptidomimetic ligands."

I. A. Wilson, "X-ray structures of antibody-peptide complexes."

Lipid modification of proteins: J. I. Gordon, discussion leader

J. I. Gordon, "Genetic and biochemical studies of protein *N*-myristoylation."

P. Casey, "Biochemistry of protein prenylation."

I. Carras, "The signal of glycophospholipid membrane anchor attachment."

Receptors

Signal transduction by receptors for PDGF and vascular endothelial growth factor: L. Williams, discussion leader

J. T. Potts, "The parathyroid hormone receptor: Evolutionary links and biological surprises."

C. D. Strader, "Structure-function relationships of the β-adrenergic receptor."

Developmental genetics: H. R. Horvitz, discussion leader

H. R. Horvitz, "Cell lineage, cell signaling and cell death in nematode development."

S. L. Zipursky, "Inductive interactions in *Drosophila* eye."

D. Botstein, "Extracting information from amino acid sequence of proteins by random replacement mutagenesis."

Proteins and peptides driving the cell cycle: A. Murray, discussion leader

A. Murray, "How cells know when to enter and leave mitosis."

J. M. Roberts, "Proteins that regulate the human cell cycle."

Peptidometics: R. M. Freidinger, discussion leader

R. M. Freidinger, "New developments in peptidomimetic research."

D. C. Horwell, "Design and development of CCK 'dipeptoid' antagonists."

G. L. Olson, "Mimicking peptide and protein architecture with nonpeptide molecules."

TBA, "du vigneaud award—I."

TBA, "du vigneaud award—II."

J. S. Fruton, "Ninety years ago—the peptide theory of protein structure."

New frontiers in neuropeptide research: TBA, discussion leader

B. M. Olivera, "Conotoxins."

N. G. Seidah, "Prohormone- and proprotein-convertrases."

Plant-Herbivore Interactions

Casa Sirena Resort

E. A. Bernays, chair; W. Fenical, vice chair

27–31 January

Herbivore modification of plant allelochemicals: M. Wink, discussion leader

H. Appel, "Running the gauntlet: Plant allelochemicals in the insect gut lumen."

R. Feyereisen, "Evolution and regulation of expression of cytochrome P450 genes in insect herbivores."

R. Lindroth, "Roles of non-oxidative detoxication enzymes in plant-insect interactions."

N. Targett, "Detoxification of allelochemicals in the marine environment."

M. Rausher, discussion leader

M. Berenbaum, "Evolution of chemical defenses in angiosperms."

Human-accelerated environmental change and plant-herbivore interactions: D. Lincoln, discussion leader

G. English-Loeb, "Understanding the effects of drought and temperature stress."

B. Bentley, "Effects of elevated carbon dioxide on the chemistry of plant-herbivore interactions."

P. Hughes, "Plant nutrition and the sulfur dioxide–plant–herbivore interaction."

C. Jones, "Ozone and plant resistance—an integrated approach."

P. Price, discussion leader

M. Dicke, "Induction of indirect defense of plants against herbivorous insects."

Aspects of marine plant-herbivore interactions: B. Fenical, discussion leader

P. Steinberg, "The ecology and evolution of seaweed phlorotannins."

J. E. Duffy, "Herbivore mobility, predation risk, and the evolution of resistance to seaweed chemical defenses."

V. Paul, "Chemical and morphological defenses of the abundant coral reef seaweed *Halimeda*."

P. Sykes, "Chemical defense: Marine pelagic algae—herbivore interactions."

Plant mimics in the marine environment: J. Pawlik, discussion leader

D. Harvell, "Chemical defenses, primary production and colonial marine invertebrates."

N. Lindquist, "Chemical ecology of larvae and eggs: 'Seeds' from marine invertebrates."

Secondary metabolites—some plant perspectives: J. Harborne, discussion leader

I. Baldwin, "Leaf damage and its biochemical consequences."

J. Gershenzon, "Metabolic turnover of secondary metabolites and the cost of defense."

S. Mole, "Trade-offs and phylogenetic constraints in the production of plant allelochemicals."

R. Northup, "Phenols in plant-litter-soil interactions."

E. Barnays, discussion leader

J. Bronstein, "Chemical ecology of plant-insect mutualisms."

Transgenic plants: C. Ryan, discussion leader

J. Ryals, "An alternative strategy for expressing insecticidal proteins in transgenic plants."

M. Peferoen, "Mechanism of action of *Bacillus thuringiensis* insecticidal crystal proteins."

R. Beachy, "Expression of virus genes in transgenic plants and their effects on plant phenotype."

F. Gould, "Ecological and evolutionary studies with transformed plants and insects."

Polymers

Doubletree Hotel

M. A. Winnik, chair; H. Yu, vice chair

6–10 January

T. Smith, discussion leader

A. Eisenberg, "Block ionomers in two and three dimensions."

F. Winnik, "Solution properties of amphiphilic derivatives of poly-*N*-(isopropylacrylamide) and their interactions with surfaces."

M. Green, "Cooperation and amplification in a macromolecular helical worm."

T. McCarthy, discussion leader

S. Stupp, "Molecular construction and properties of two-dimensional polymers."

H. Yu, discussion leader for poster session

S. Smith, discussion leader

B. Novak, "Inverse organic-inorganic composite materials. New route into nonshrinking sol-gel composites."

R. Duran, "Polymerization reactions restricted to surfaces."

M. Tirrell, discussion leader

A. Gent, "Interlinking, interdiffusion, and adhesion."

R. Wool, discussion leader

P. G. de Gennes, "Molecular pictures of adhesion."

T. Russell, "The diffusion of polymers across an interface."

B. Chu, discussion leader

M. Rafailovich, "Conformation of end-grafted polymers in a blend."

M. Yamamoto, "Thermal relaxation of multilayer structures of poly (vinyl alkylal) prepared by the Langmuir-Blodgett technique."

J. Frechet, "Dendritic polymers and copolymers: Design, synthesis and characterization."

G. Berry, discussion leader

D. Roitman, "Solution properties of rigid rod polymers."

M. Rubinstein, "Dynamics of block copolymers."

M. Ediger, discussion leader

W. Knoll, "Polymer thin films characterized with evanescent light."

A. Kirk, "Interactions in associatively thickened solutions."

Y. H. Kim, "Prediction of bulk and diffusion properties of polymers using molecular dynamics simulations."

R. S. Stein, discussion leader

J. E. Guillet, "Our plastic environment."

H. Yu, discussion leader

F. Brochard, "Wetting and dewetting of polymers on model surfaces."

R. Prud'homme, "Gelation of polymer solutions: Equilibrium versus nonequilibrium, chemical versus physical gels."

Abstracts for poster presentations should be sent, prior to 1 December 1991, to Professor H. Yu, Department of Chemistry, University of Wisconsin, Madison, WI 53706.

Polymers for Biosystems

Casa Sirena Resort

K. J. Himmelstein, chair; D. Tirrell, vice chair

24–28 February

R. Lenz, discussion leader

E. Goldberg, "Surface modification by graft polymerization."

K. Mosbach, "Molecular recognition obtained by molecular imprinting of polymers."

L. Freed, "Chondrocytescultures on bioerodible polymers."

E. Miller, discussion leader

B. Ratner, "Mechanism of degradation of poly ether urethanes."

D. Daniels, "Mechanical and biological response of poly (ortho esters) for tissue stabilization."

J. Heller, discussion leader

P. Lee, "Hydrophobic anionic gels for swellable and erodible delivery systems."

S. Kusumoto, "Macromolecules on bacterial surface: Structure, synthesis, and immuno stimulation."

S. Shalaby, "Tailored surfaces in biomedical polymers."

G. Loomis, discussion leader

R. Dunn, "In situ forming bioerodible delivery systems."

J. Kohn, "Natural metabolites for the design of polymers for medicine."

S. W. Kim, discussion leader

J. Jacob-LaBarre, "Polymer composites for tissue reconstruction."

A. Heller, "Redox centers of enzymes to electrodes: Connected three-dimensional polymers."

H. Alexander, "Reaction of bone to absorbable polymers."

A. S. Hoffman, discussion leader

P. Aebischer, "Polymers for reconstruction of lesioned nervous system structures."

D. Urry, "Elastin protein-based polymers: Biomimetic mechanism and materials."

R. Siegel, discussion leader

H. Blanch, "Enzymatic production of saccharide-containing polymers."

A. Beck-Seckinger, "Synthesis of proteins."

V. Torchilin, "Monoclonal antibodies conjugated with polymer chelates."

D. Tirrell, discussion leader

J. M. Anderson, "Regulatory guidelines: Perspective and implications for research."

K. Knutson, discussion leader

P. DeBenedetti, "Processing of pure polymers using supercritical fluids."

M. Saltzman, "Polymers for controlling cell behavior."

Prolactin

Casa Sirena Resort

N. Ben-Jonathan, chair; A. Bartke, vice chair

3–7 February

Anterior pituitary lactotrophs: M. Lorenson, discussion leader

S. Frawley, "Role of the neurointermediate lobe in the dynamic release of prolactin."

J. Hyde, "Co-regulation of prolactin and galanin in the anterior pituitary."

P-M. Lledo, "Different approaches to study the stimulus-secretion coupling in anterior pituitary cells."

Comparative aspects of prolactin: A. Bartke, discussion leader

H. Kawauchi, "Isolation and characterization of somatolactin, a new member of the prolactin-growth hormone family prolactin-dependent transcription factors in the pigeon crop sac."

N. Horseman, "Prolactin-dependent transcription factors in the pigeon crop sac."

Regulation of prolactin gene expression: A. Gutierrez-Hartman, discussion leader

R. Maurer, "Multihormonal regulation of prolactin gene expression."

M. Seyfred, "Molecular mechanism of estrogen-induced rat prolactin gene expression."

C. Bancroft, "Neuropeptide and neurotransmitter regulation of prolactin gene expression."

Decidual and placental lactogenic hormones: F. Talamantes, discussion leader

S. Handwerger, "Evidence for novel autocrine-paracrine regulation of the synthesis and release of human decidual prolactin."

M. Soares, "The rat placental prolactin family."

Prolactin and the neuroendocrine system: W. Samson, discussion leader

J. Voogt, "Tyrosine hydroxylase is regulated by pituitary prolactin and placental secretions."

C. Grosvenor, "Bioactive prolactin in milk."

K. Lookingland, "Afferent neuronal regulation of tuberoinfundibular dopamine neurons and prolactin secretion."

Prolactin receptors: C. Nicoll, discussion leader

P. Kelly, "Identifications of domains of the prolactin receptor involved in ligand binding and signal transduction."

D. Linzer, "Interaction of the prolactin receptor with cellular proteins."

Prolactin and the immune system: W. Hymer, discussion leader

D. Montgomery, "Bidirectional communication between pituitary prolactin and the immune system: Modulation of lymphocyte proliferation and pituitary prolactin gene expression."

C. Clevenger, "Regulation of IL-2–stimulated T cell proliferation by nuclear prolactin."

L-Y. Yu-Lee, "Prolactin regulation of the transcription factor IRF-1: Implications for the T cell cycle progression."

J. Porter, "Hypothalamic-pituitary system: Coordination of prolactin secretion."

Prolactin secreting tumors and second messengers: R. Weiner, discussion leader

E. Hooghe-Peters, "The expression of Pit-1 in normal tissue and pituitary tumors."

J. Davis, "Calcium regulation of the rat and human prolactin genes."

P. Dannies, "Mechanisms of dopaminergic inhibition of prolactin release."

Science Education

Doubletree Hotel

A. H. Cowley, co-chair; P. Saltman, vice co-chair

30 March–3 April

L. Pauling, "A personal view of teaching and research."

N. Hackerman, "Why is science literacy important in society?"

B. A. Shakhashiri, "How can science literacy be achieved?"

G. Brown, "Toward a national policy for science and science education."

S. Ride, "Serving the unserved in science. Who's let in and who is left out?"

J. Slaughter, "How a major research university rewards teaching."

R. Wilson, "Can teaching effectiveness REALLY be measured?"

H. B. Gray, "Strategies for teaching science majors."

S. Tobias, "Science education reform: What's wrong with the paradigms?"

J. Guthrie, "Who teaches the teachers to teach?"

In the beginning. The genesis of science teaching in elementary and secondary school.

P. Saltman, "Who teaches?"

L. Schulman, "How do they teach it?"

S. Hill, "Mathematics education: A strategy for reform."

Curricular reform in science education.

F. J. Rutherford, "Project 2061."

B. Aldridge, "Scope, sequence, and coordination."

H. Gysling, "What is industry doing about science education?"

J. Nobel-Wilford, "What are the media doing about science education?"

R. Nicholson, "What are the scientific societies doing about science education?"

Keynote addressed, TBA

Round-table discussion

L. Williams, A. Kaldor, "Where do we go from here?"

Sensory Transduction in Microorganisms

Casa Sirena Resort

G. L. Hazelbauer, chair; J. Spudich, vice chair

13–17 January

Prokaryotic receptors: M. Simon, discussion leader

D. E. Koshland, Jr., "Structure of the aspartate receptor and mechanisms of transmembrane signaling."

Y. Imae, "Ligand recognition by bacterial chemoreceptors."

M. Inouye, "Requirements of both kinase and phosphatase activities for ligand-mediated signal transduction."

Eukaryotic receptors: P. Devreotes, discussion leader

A. Kimmel, "Regulation and function of the cAMP receptor gene family of *Dictyostelium*."

C. Klein, "Receptor-mediated events in *Dicryostelium* aggregation."

L. Marsh, "Structure and function of the yeast α-factor receptor."

Prokaryotic signaling: J. S. Parkinson, discussion leader

F. Dahlquist, "Role of CheW in coupling receptor and kinase."

J. Stock, "Response regulator scenarios."

L. Tisa, "Calcium ions and *Escherichia coli* chemotaxis."

Eukaryotic signaling I: P. van Haastert, discussion leader

D. Stone, "Signaling and adaptation

in the yeast mating pheromone response."

R. Firtel, "The G-protein family in *Dictyostelium.*"

Photoresponse: T. Sakmar, discussion leader

J. Spudich, "Sensory rhodopsin-I: Receptor activation and signal relay."

K. Foster, "Rhodopsin of *Chlamydomonas.*"

P. Hagemann, "Controversial perspectives about *Chlamydomonas* rhodopsin."

D. Oesterhelt, "Alternative chemistries of covalent modification in an archaebacterial sensory system."

Eukaryotic signaling II: J. Schulz, discussion leader

T. Davis, "What is the function of calmodulin that is essential for growth of yeast?"

A. Nogel, "Dynamics of cytoskeleton during differentiation and development of *Dictyostelium.*"

Prokaryotic motility: D. DeRosier, discussion leader

H. Berg, "Adventures with MotA and MotB."

M. Eisenbach, "Control mechanisms of flagellar rotation."

R. Macnab, "What is an F_0F_1 ATPase homolog doing in the flagellum?"

Eukaryotic motility: J. Spudich, discussion leader

S. Zigmond, "Control of motility in leukocytes."

D. Drubin, "Molecular genetics of the yeast actin cytoskeleton."

S. Brown, "Motor proteins in yeast."

Prokaryotic variations: D. Zusman, discussion leader

A. Lois, "Oxygen sensing and signal transduction in a bacterial symbiont."

C. Shaw, "Molecular investigations of environmental response in *Agrobacterium tumefaciens.*"

Superconductivity

Casa Sirena Resort

G. Crabtree, chair; D. Johnston, vice chair

6–10 January

M. B. Maple, discussion leader

B. Raveau, "Crystal chemistry of copper oxidies: Oxygen nonstoichiometry and superconductivity."

K. R. Poeppelmeier, "Synthesis and characterization of a new family of cuprate superconductors: $LnSr_2Cu_2GaO_7$."

J. D. Jorgensen, "Chemical instabilities in the superconducting oxides."

A. M. Stacy, discussion leader

B. W. Veal, "Properties of $YBa_2Cu_3O_{7-8}$: Dependence on oxygen stoichiometry and vacancy ordering."

H. Wuhl, "Thermodynamic measurements of the superconducting transition in untwinned $YBa_2Cu_3O_x$."

D. W. Murphy, discussion leader

J. E. Fischer, "Structure and dynamics in solid C_{60} and its alkali metal intercalation compounds."

T. T. M. Palstra, "Superconductivity in C_{60} compounds."

K. Holczer, "Superconducting and normal state properties of C_{60} compounds."

P. B. Allen, discussion leader

J. P. Franck, "Experimental studies of the isotope effect in cuprate superconductors."

H. A. Mook, "Phonon and magnetic excitations in high temperature superconductors."

T. K. Worthington, discussion leader

D. R. Nelson, "Correlations and transport in vortex liquids."

P. L. Gammel, "Experiments on the vortex phase."

D. E. Farrell, "Experiments on flux lattice melting."

M. Suenaga, "Measurements of irreversibility temperatures: Bulk versus films; magnetic versus transport techniques."

D. C. Larbalestier, discussion leader

L. Civale, "Pinning by columnar structures in Sn-irradiated $YBa_2Cu_3O_x$."

M. Tachiki, "Flux lines in layered cuprate superconductors."

T. H. Geballe, discussion leader

O. Fischer, "Properties of $YBa_2Cu_3O_x$/$PrBa_2Cu_3O_x$ multilayers."

D. H. Lowndes, "Anisotropy and reduced dimensionality in superconducting superlattices."

C-B. Eom, "Synthesis and properties of *a*-axis $YBa_2Cu_3O_x$/$PrBa_2Cu_3O_x$ superlattices."

I. Bosovic, "MBE synthesis and superconductivity in multilayer BiSrCaCuO structures."

M. V. Klein, discussion leader

R. J. Joynt, "Multicomponent order parameters in heavy fermion and copper oxide systems."

Z-X. Shen, "Fermiology and superconducting gap of $Bi_2Sr_2CaCu_2O_8$ by angle-resolved photoemission."

J. G. Tobin, "Photoemission in $YBa_2Cu_3O_x$ single crystals."

R. C. Dynes, discussion leader

L. Mihaly, "Tunneling and infrared studies: Agreements and disagreements."

M. Boekholt, "Raman, brillouin, and tunneling spectroscopies in $Bi_2Sr_2CaCu_2O_8$ single crystals."

A. A. Abrikosov, "Electronic Raman light scattering in layered superconductors."

Thrombolysis

Doubletree Hotel

E. F. Plow, chair; H. R. Lijnen, vice chair

23–27 March

E. Davie, discussion leader

F. Blasi, "Urokinase and urokinase receptor gene expression."

D. Loskutoff, "PAI-1 gene expression in vivo."

S. Huang, "Biosynthesis of fibrinogen."

R. Mulligan, "Stable gene expression in endothelial cells."

V. Marder, discussion leader

B. Adelman, "Animal models of thrombosis/thrombolysis."

E. Topol, "Current status of thrombolytic trials."

J. Hirsh, "Thrombolytic therapy in thrombotic diseases."

S. Pizzo, discussion leader

D. Ginsberg, "Mutational analysis of PAI-1 and other serpins."

R. Girard, "Three-dimensional structure of PAI-1."

S. Pizzo, "α_2-macroglobulin structure and function."

E. Kruithof, "PAI-2 structure and function."

E. Barbathan, discussion leader

R. Rijken, "Thrombolytic receptors in the liver."

D. Perlmutter, "Serpin: Protease receptors."

R. Lottenberg, "Plasmin receptors of bacteria."

E. Haber, discussion leader

D. Collen, "New thrombolytic agents."

D. FitzGerald, "Platelet antagonists as adjunctive agents in thrombolysis."

H. Gold, "Anticoagulants as adjunctive agents in thrombolysis."

J. Henkin, discussion leader

T. Ny, "The thrombolytic system in reproductive biology."

D. Boyd, "The thrombolytic system in tumor cell invasion and metastasis."

L. Miles, "Lp (a) and thrombolysis."

H. R. Lijnen, discussion leader

F. Castellino, "Expression and functional analysis of kringles."

B. DeVos, "Crystal structure of t-PA kringle 2."

V. Gurewich, "Functional analysis of pro-urokinase."

B. Schwartz, discussion leader

H. Chapman, "The thrombolytic system of monocytes/macrophages."

J. Loscalzo, "Platelets and fibrinolysis."

Daily poster sessions will be held as well as a panel discussion on current issues in thrombolytic therapy."

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