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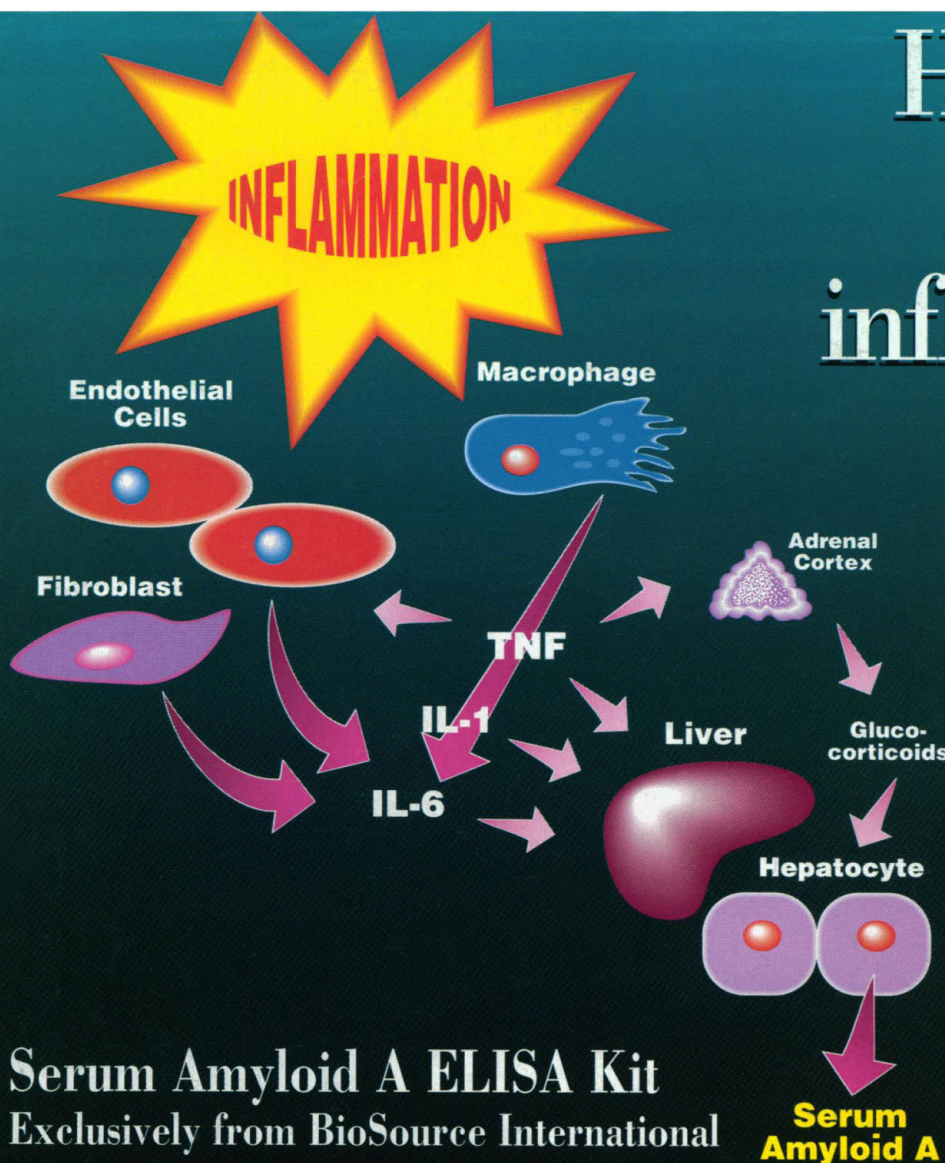


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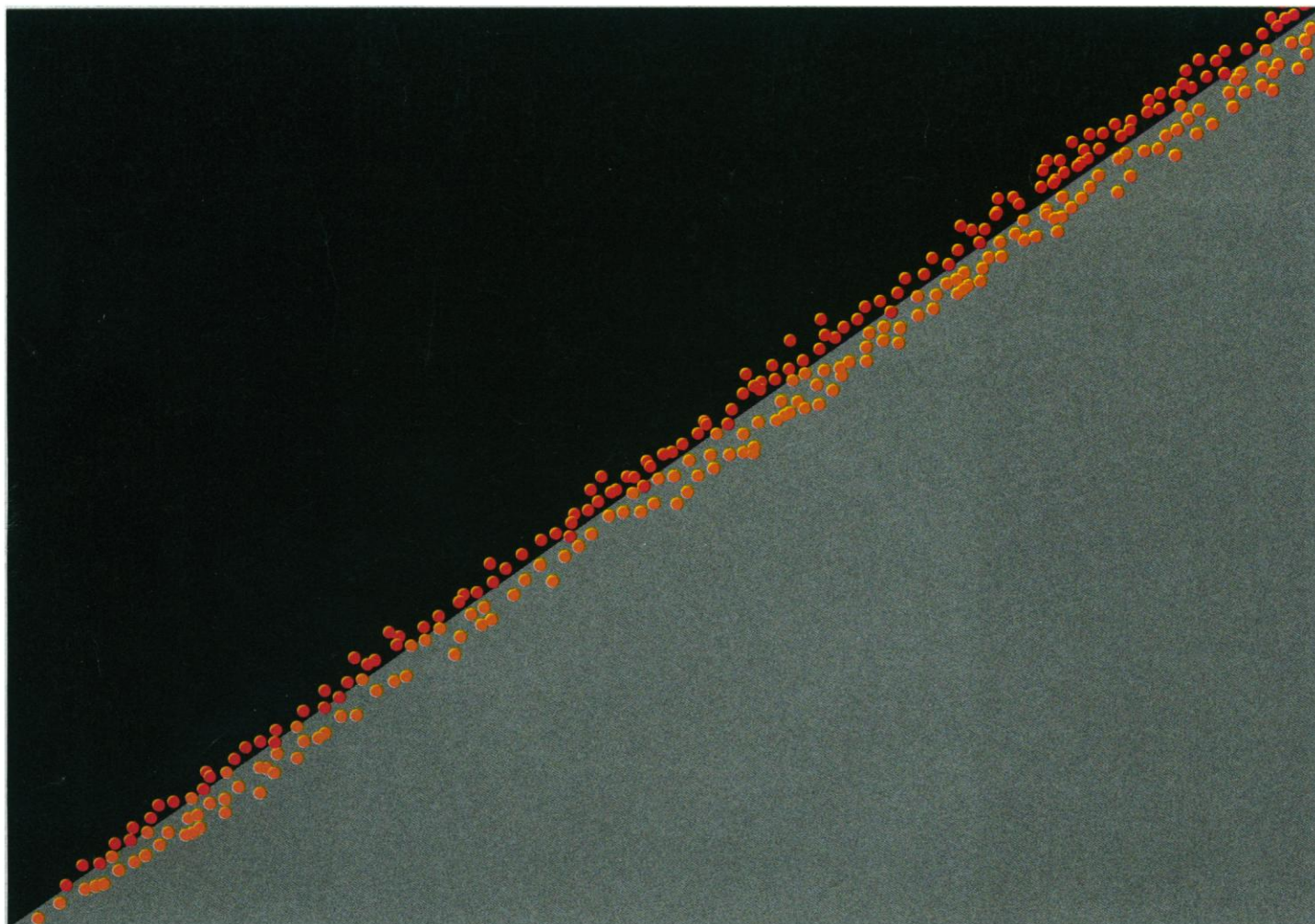
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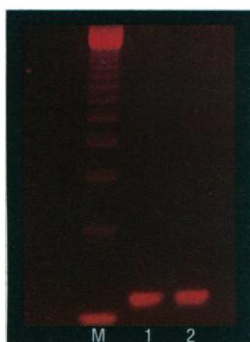
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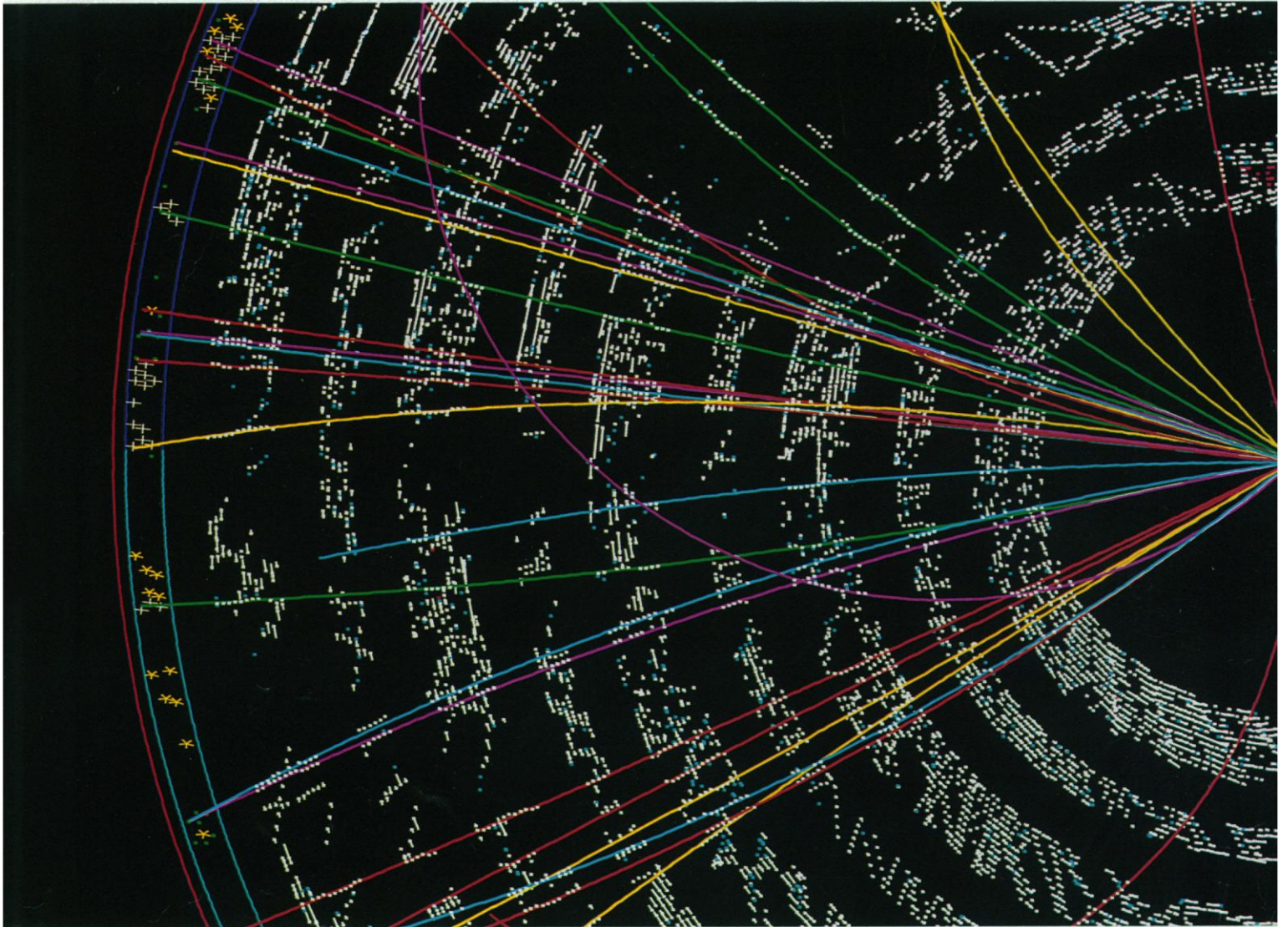
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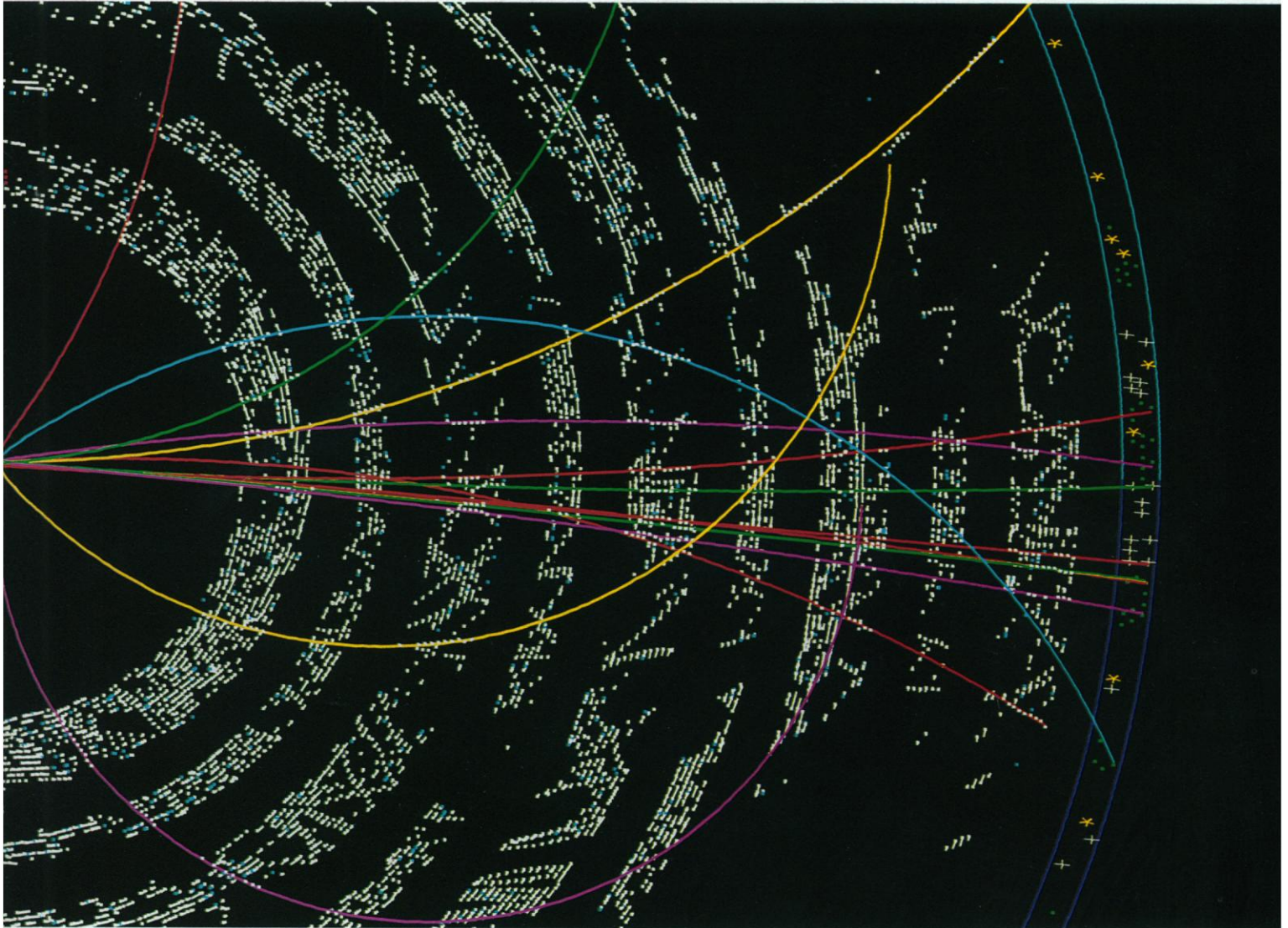
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If there's one thing you can count on in science, it's that your data will increase exponentially but your funding won't.

The scientists at Fermi National Accelerator Laboratory (Fermilab) have encountered this problem in a very big way. The data Fermilab processes for subnuclear event reconstruction and modeling has reached 40 terabytes a year. And they've developed an innovative solution to meet their needs.

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Computer reconstruction of proton/anti-proton collision at Fermilab.



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processor farm. This farm gives Fermilab a full 3,000 MIPS that can be dedicated to a single parallel processing application.

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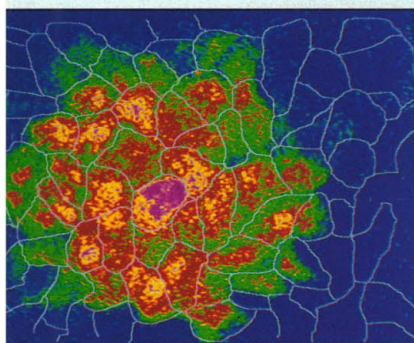


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212 & 213

Scientific study of
violence



Mechanism of
propagation of
calcium waves

292

POLICY FORUM

- Rational Science, Irrational Reality: A Congressional Perspective on Basic Research and Society 200
G. E. Brown, Jr.

NEWS & COMMENT

- R&D Budget Collides With the Deficit 208
Top HHS Lawyer Seeks to Block NIH What the Patent Office Report Says 209
Did Political Clout Win Vaccine Trial for MicroGeneSys? 211
HHS 'Violence Initiative' Caught in a Crossfire 212
Violence Epidemiologists Test the Hazards of Gun Ownership 213

RESEARCH NEWS

- The Brain Remaps Its Own Contours 216
Spinal Cord Injuries: New Optimism Blooms for Developing Treatments Unorthodox Treatment Stirs Controversy 218
A Revisionist Timetable for the Ice Ages 220

- Deep-Living Microbes Mount a Relentless Attack on Rock 222

PERSPECTIVES

FOCUS ON NEUROSCIENCE

- Dividing Up the Neocortex 237
C. J. Shatz
Circadian Clock Genes Are Ticking 238
J. S. Takahashi
Ion Channel Structure and Function 240
C. Miller
Bench to Bedside: The Glutamate Connection 241
D. W. Choi
Are Adult Learning Mechanisms Also Used for Development? 243
E. R. Kandel and T. J. O'Dell

- The Physiology of Memory: Recordings of Things Past 245
R. Desimone

ARTICLES

- Continuous 500,000-Year Climate Record from Vein Calcite in Devils Hole, Nevada 255
I. J. Winograd, T. B. Coplen, J. M. Landwehr, A. C. Riggs, K. R. Ludwig, B. J. Szabo, P. T. Kolesar, K. M. Revesz

DEPARTMENTS

- | | | | |
|-----------------------------|-----|--|-----|
| THIS WEEK IN SCIENCE | 197 | MEETINGS | 321 |
| EDITORIAL | 199 | Gordon Research Conferences: A. M. Cruickshank | |
| The Dimensions of the Brain | | BOOK REVIEWS | 333 |
| LETTERS | 203 | <i>A Scientist's Voice in American Culture</i> , reviewed by T. Alborn • <i>Framing Disease</i> , P. Conrad • <i>The Early Observable Universe from Diffuse Backgrounds</i> , G. Mathews • <i>Ferroelectric Liquid Crystals</i> , H. Pleiner | |
| SCIENCESCOPE | 207 | PRODUCTS & MATERIALS | 345 |
| RANDOM SAMPLES | 223 | | |

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COVER

Time-lapse confocal images of four cells migrating in living slices of cerebral cortex from newborn ferrets. The temporal sequences are depicted in false color with the final position shown in red. The diversity of migratory pathways may disperse young neurons widely

from their sites of origin. These neurons migrated approximately 10 to 25 micrometers per hour. See page 299. For additional Reports, Perspectives, and News stories that focus on the neurosciences, see This Week in *Science*. [Image: M. Dailey]



- Rodent Carcinogens: Setting Priorities** 261
L. S. Gold, T. H. Slone, B. R. Stern,
N. B. Manley, B. N. Ames

REPORTS

- Compositional Trends in Rock-Forming Elements of Comet Halley Dust** 266
M. N. Fomenkova, J. F. Kerridge, K. Marti,
L.-A. McFadden
- X-ray Laser Microscopy of Rat Sperm Nuclei** 269
L. B. Da Silva, J. E. Trebes, R. Balhorn, S. Mrowka,
E. Anderson, D. T. Attwood, T. W. Barbee, Jr.,
J. Brase, M. Corzett, J. Gray, J. A. Koch *et al.*
- Room-Temperature, Electric Field-Induced Creation of Stable Devices in CuInSe_2 Crystals** 271
D. Cahen, J.-M. Gilet, C. Schmitz, L. Chernyak,
K. Gartsman, A. Jakubowicz
- Observations of the Liquid-Crystal Analog of the Abrikosov Phase** 275
K. J. Ihn, J. A. N. Zasadzinski, R. Pindak,
A. J. Slaney, J. Goodby
- Microbial Control of Silicate Weathering in Organic-Rich Ground Water** 278
F. K. Hiebert and P. C. Bennett
- Fault Zone Connectivity: Slip Rates on Faults in the San Francisco Bay Area, California** 281
R. Bilham and P. Bodin
- Mass-Spectrometric ^{230}Th - ^{234}U - ^{238}U Dating of the Devils Hole Calcite Vein** 284
K. R. Ludwig, K. R. Simmons, B. J. Szabo,
I. J. Winograd, J. M. Landwehr, A. C. Riggs,
R. J. Hoffman
- Regulation of the Amount of Starch in Plant Tissues by ADP Glucose Pyrophosphorylase** 287
D. M. Stark, K. P. Timmerman, G. F. Barry,
J. Preiss, G. M. Kishore
- Intercellular Propagation of Calcium Waves Mediated by Inositol Trisphosphate** 292
S. Boitano, E. R. Dirksen, M. J. Sanderson
- Inhibition of Neutrophil Chemokinesis on Vitronectin by Inhibitors of Calcineurin** 296
B. Hendey, C. B. Klee, F. R. Maxfield
- Diverse Migratory Pathways in the Developing Cerebral Cortex** 299
N. A. O'Rourke, M. E. Dailey, S. J. Smith,
S. K. McConnell
- Prevention of Programmed Cell Death of Sympathetic Neurons by the *bcl-2* Proto-Oncogene** 302
I. Garcia, I. Martinou, Y. Tsujimoto, J.-C. Martinou
- Release of Alzheimer Amyloid Precursor Derivatives Stimulated by Activation of Muscarinic Acetylcholine Receptors** 304
R. M. Nitsch, B. E. Slack, R. J. Wurtman,
J. H. Growdon
- Acetylcholine Receptor Channel Structure Probed in Cysteine-Substitution Mutants** 307
M. H. Akabas, D. A. Stauffer, M. Xu, A. Karlin
- Calcium Channels Coupled to Glutamate Release Identified by ω -Aga-IVA** 310
T. J. Turner, M. E. Adams, K. Dunlap
- Effects of Kinesin Mutations on Neuronal Functions** 313
M. Ghoo, K. McDonald, B. Ganetzky, W. M. Saxton

TECHNICAL COMMENTS

- The Dispersion of Neuronal Clones Across the Cerebral Cortex** 317
T. B. L. Kirkwood, J. Price, E. A. Grove, C. Walsh,
C. L. Cepko, E. F. Ryder, G. M. Church, C. Tabin

220, 255 & 284

Pleistocene climates and Milankovitch: The view from Devils Hole



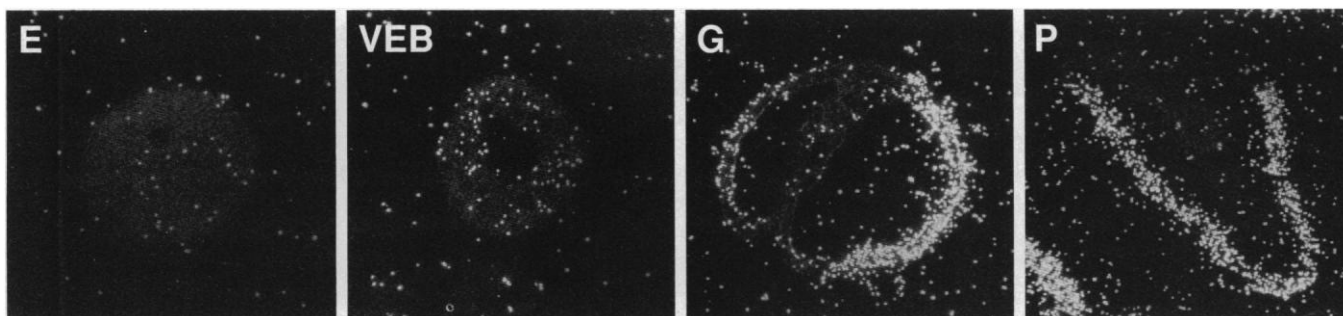
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Glacial cycling

Most of the data supporting orbital forcing of Pleistocene glaciation (the Milankovitch cycle) has been based on marine climate records. Winograd *et al.* (p. 255) present a 500,000-year climate record based on oxygen-18 variations from calcite in Devils Hole, Nevada. Uranium series dating of the calcite is presented by Ludwig *et al.* (p. 284). These papers question the Milankovitch explanation; see News story by Kerr (p. 220).

Aqueous alteration of comet Halley

During 1986, two Soviet spacecraft carrying time-of-flight mass spectrometers flew by comet Halley and analyzed impacting particles. Although the total amount of material sampled was small, the data provide a direct sample of the composition of comets, which are thought to contain material dating from the formation of the solar system. Formenkova *et al.* (p. 266) reanalyzed these data to account specifically for the mass of each impacting particle and used all of the available data (2368 spectra). Most particles were a mixture of silicates and organic material, but some were evidently magnesium carbonate that indicate that the comet underwent a history of aqueous alteration.

Field effects

Semiconductor junctions between *p*- and *n*-type doped layers are normally produced by thermal diffusion or ion implantation of a foreign species. Cahen *et al.* (p. 271) found that application of a strong local electric field to a homogenous single crystal of CuInSe₂ at room tem-

Neuroscience nexus

Neuroscience encompasses a broad range of subdisciplines that range from understanding the molecular and cell biology of neuronal signals to studies of normal behavior and of disease states (see Editorial by Koshland, p. 199). A series of Perspectives focuses on some current research topics: how the mammalian neocortex becomes organized and subdivided (Shatz, p. 237); the molecular basis of circadian rhythms (Takahashi, p. 238); the relation of ion channel structure and function (Miller, p. 240); the role of excitatory neurotransmitters in disease (Choi, p. 241); how learning mechanisms might be used in development (Kandel and O'Dell, p. 243); and the cellular basis of memory (Desimone, p. 245). In Reports, O'Rourke *et al.* (p. 299) present confocal microscopic evidence that, in early development of the mammalian cerebral cortex, neuronal migration is not strictly radial. Garcia *et al.* (p. 302) show that programmed cell death, a process initiated by a lack of trophic factors, can be prevented in the sympathetic nervous system by the *bcl-2* proto-oncogene. Nitsch *et al.* (p. 304) demonstrate that the release of Alzheimer's amyloid precursor protein derivatives is stimulated by muscarinic acetylcholine (ACh) receptors. Akabas *et al.* (p. 307) identified a putative β -strand lining, the pore of the open and closed states of the ACh receptor by making Cys mutants, which can bind small molecules that block the channel. Turner *et al.* (p. 310) used a spider neurotoxin to characterize calcium channels important for glutamate release in the presynapse, an area that is difficult to study with electrodes. Gho *et al.* (p. 313) show that motor neurons of *Drosophila* deficient in kinesin, an adenosine triphosphatase believed to be involved in transport in the axon, have a normal complement of synaptic vesicles but are impaired in propagating action potentials and releasing neurotransmitters. News stories focus on the neuronal plasticity of the adult sensory cortex (Barinaga, p. 216) and on efforts to regenerate the neurons of the spinal cord (Travis, p. 218).

perature could produce semiconductor junctions. Although CuInSe₂ is a semiconductor, it can also exhibit ionic conductivity through migration of copper ions. The bipolar transistors made by application of the high field are stable under low-voltage operating conditions. The authors point out that many mechanisms may account for this transformation and suggest that electromigration of defects or electric field-assisted reactions at defects could be possible causes for the formation of these sharp junctions. They also point out the possibility of using the high local fields of a scanning tunneling microscope

to fashion arrays of junctions at the nanometer scale.

Repeated patterns

Certain liquid crystals have a molecular organization that is analogous to the Abrikosov lattice, the arrangement of magnetic field lines (flux vortices) in type-II superconductors. In smectic A* liquid crystals, the molecules associate in layers, as in the normal smectic phase, but screw dislocations are present that divide the layers in blocks in which the layers are rotated relative to one another. Ihn *et al.* (p. 275) used freeze-fracture microscopy to ex-

amine the structure of the smectic A* phase in a liquid crystal. Moreover, the images show that the smectic A* phase belongs to the class of "frustrated" materials in which a preferred local packing must compete with the constraints of long-range order.

Starch synthesis

The economic and nutritional utility of an agricultural crop can depend on its starch content. Stark *et al.* (p. 287) identify a rate-limiting step in the metabolic pathway leading to the synthesis of starch in plants. This biosynthetic pathway occurs in the plastids, and its regulation at this step resembles that of bacterial rather than yeast and mammalian starch biosynthesis. Transgenic plants that overexpress the enzymatic function of the rate-limiting step also overproduce starch. Starch accumulation could be seen in tissues that normally do not produce much starch, such as the leaves of tomato. Also, accumulation in starchy tissues, such as the potato tuber, could be increased.

Cell motility

Cells move across a substratum by repeated cycles of attachment and release. In cells that are stimulated to migrate by chemoattractants, the concentration of intracellular Ca²⁺ ([Ca²⁺]_i) oscillates. If the [Ca²⁺]_i does not increase, detachment of cells is inhibited and motility is reduced. Hendey *et al.* (p. 296) report that inhibition of the Ca²⁺-dependent phosphatase calcineurin also decreased migration of cells on the extracellular matrix protein vitronectin by interfering with detachment, indicating that calcineurin helps regulate cell motility.

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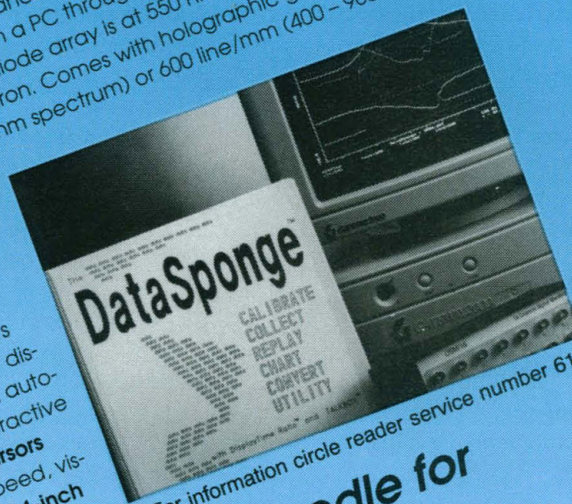
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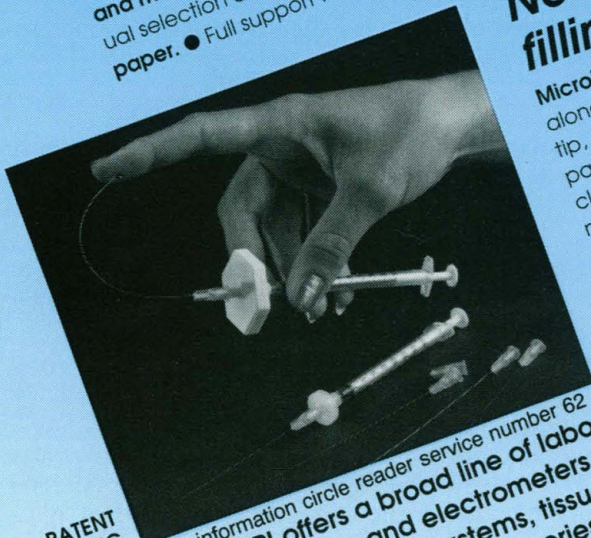
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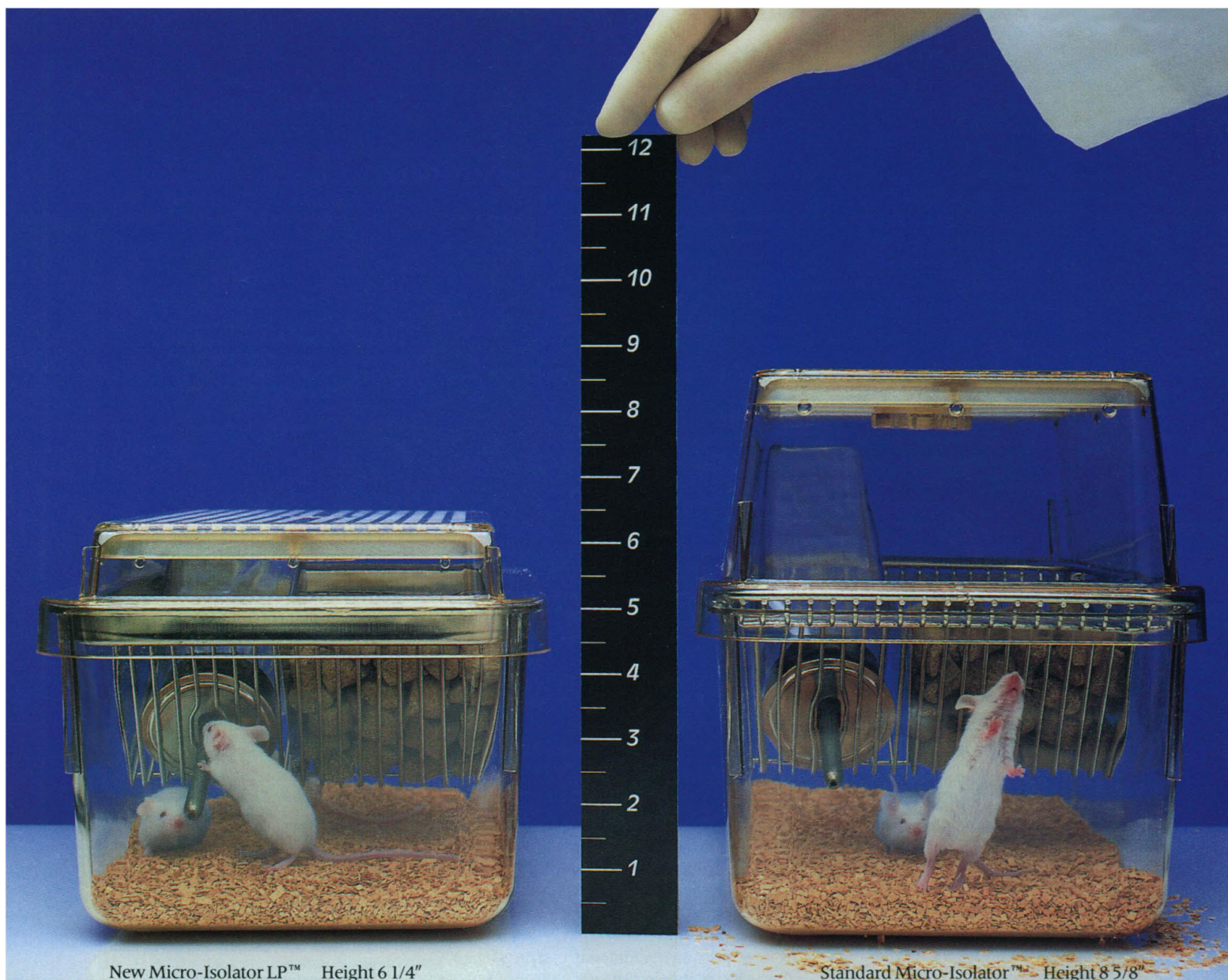
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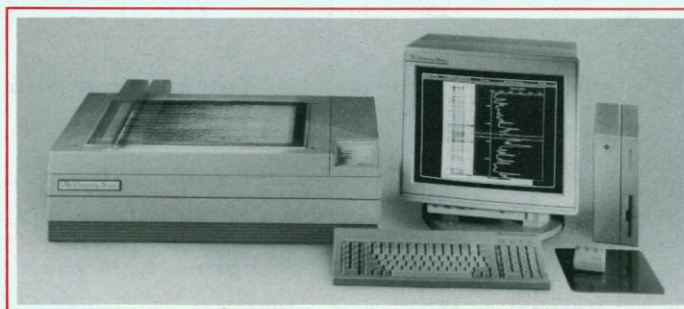
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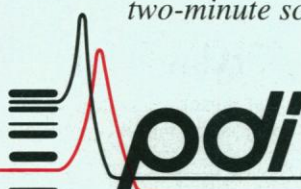
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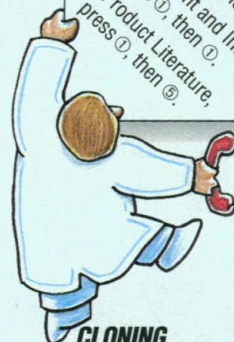
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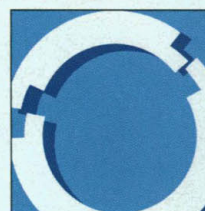
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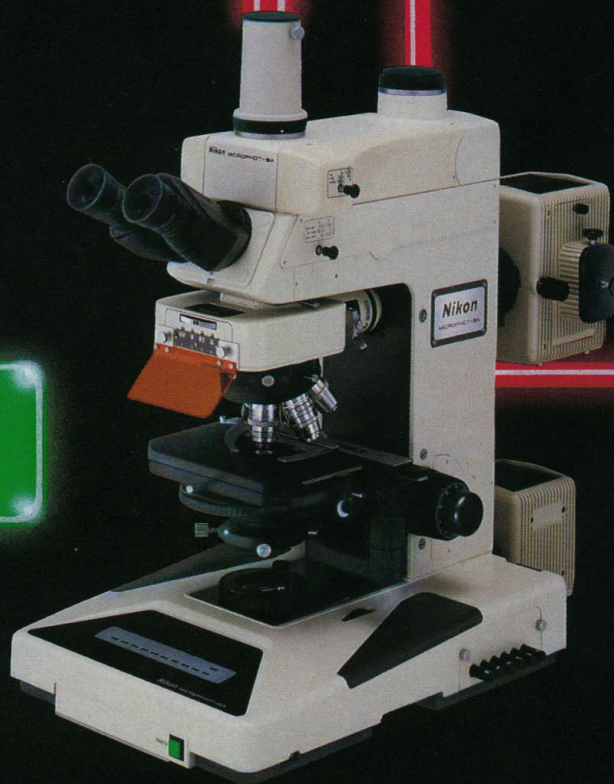
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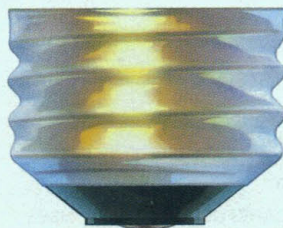
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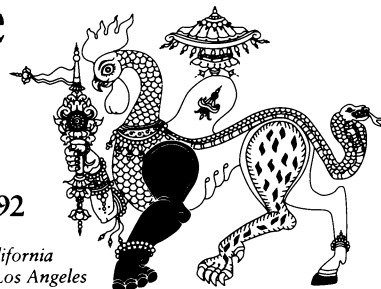
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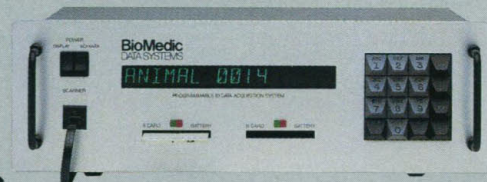
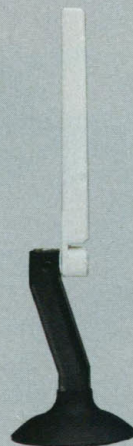
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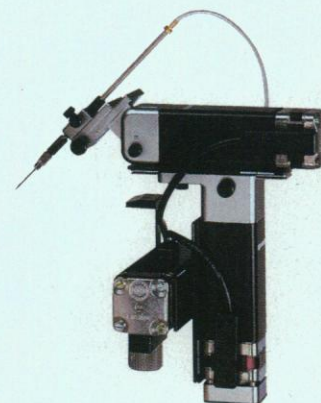
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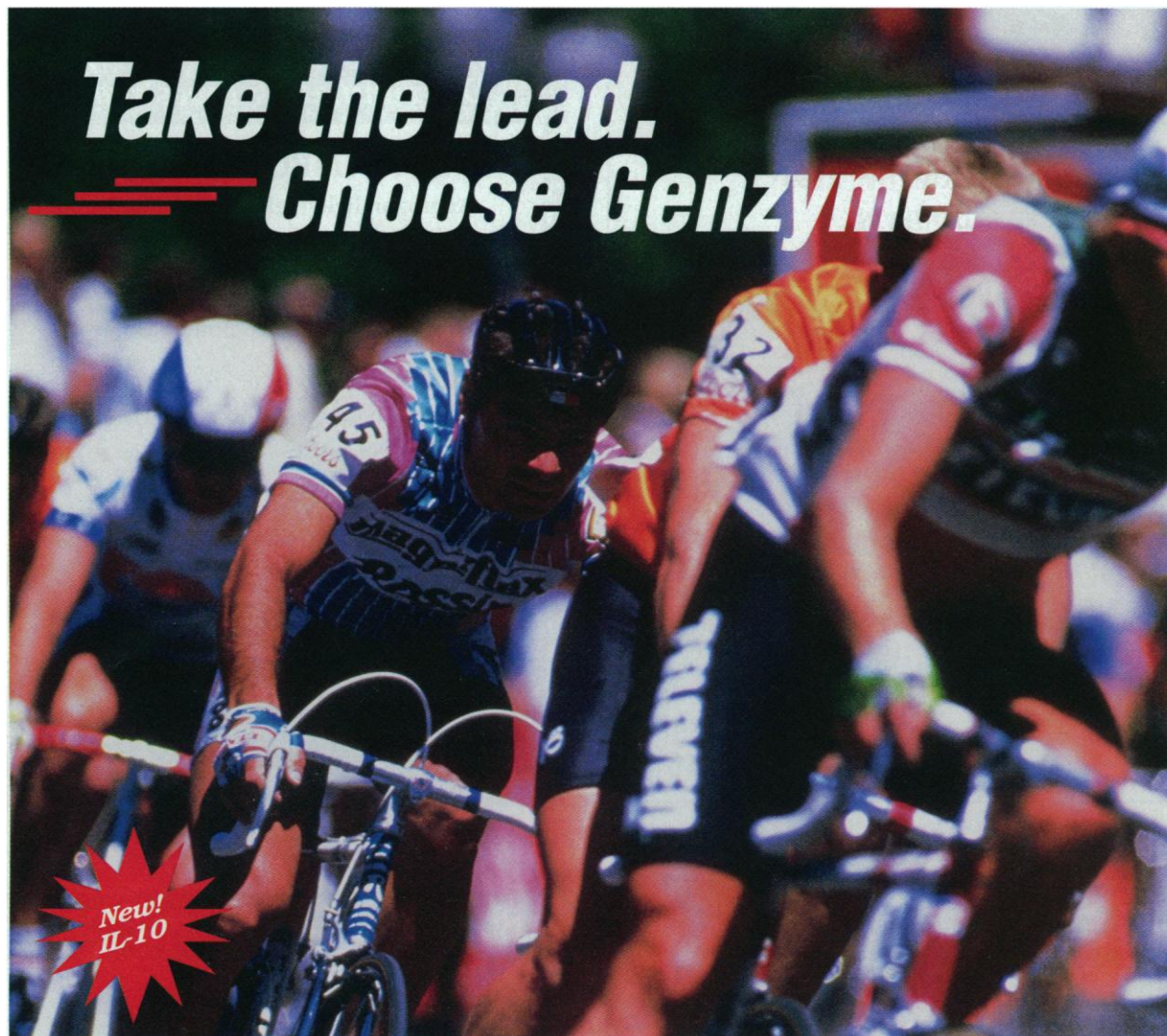
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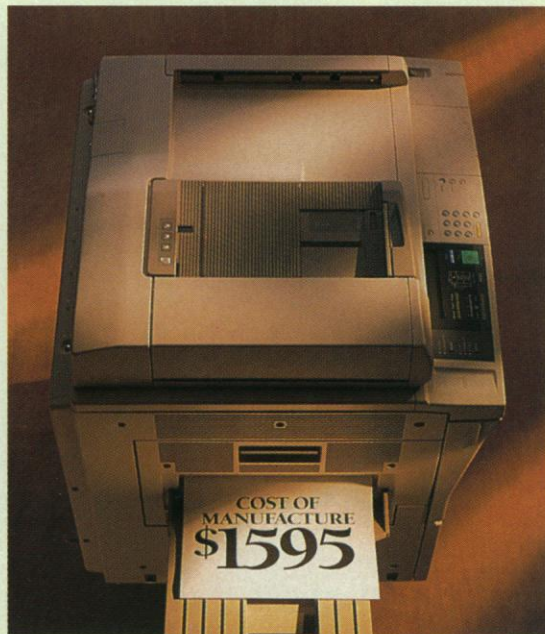
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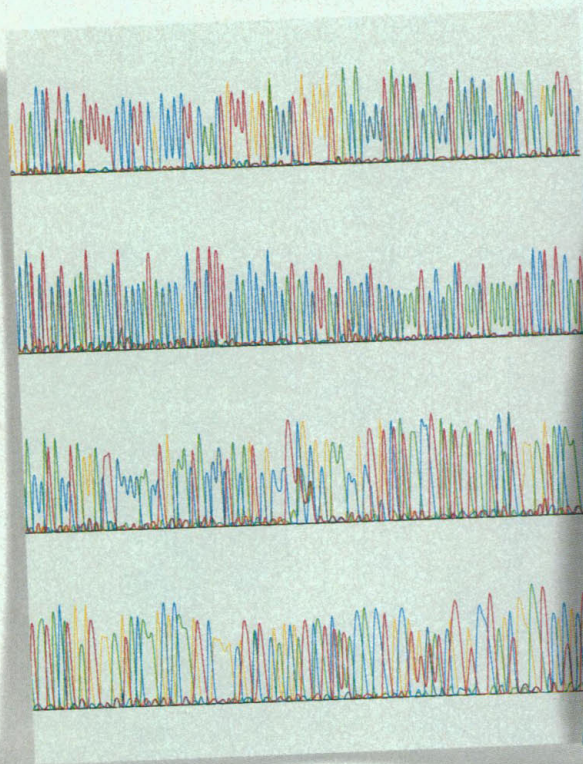
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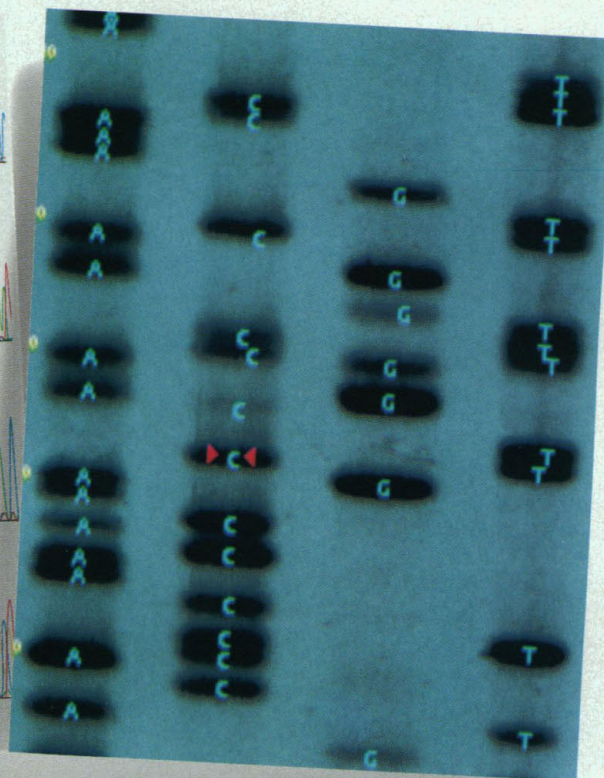
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THE CARE TO MEET, TO KNOW, TO UNDERSTAND

SOME OF THE INTERNATIONAL MEETINGS SCHEDULED FOR 1993 ARE:

"Experimental and Clinical Precancerous Lesions: Approaches to Cancer Prevention and Early Diagnosis"

P. Marks (USA) and R. Weil (CH)
Montreux (CH), March 29-31

"Molecular Diagnosis and Monitoring of Leukaemia and Lymphoma"

F. Grignani (I)
Perugia (I), April 15-17

"Molecular Basis of Inflammation"

J. Navarro (USA)
Heidelberg (D), April 21-23

"Metabolism in the Female Life Cycle"

M.P. Diamond and F. Naftolin (USA)
Taormina (I), May 17-18

"Recent Advances on Monoclonal Gammopathies and Related Malignancies"

B. Barlogie (USA) and F. Dammacco (I)
Evian (F), June 3-5

"Inhibin and Inhibin-Related Proteins"

H.G. Burger (AUS)
Siena (I), June 17-18

"Cell and Molecular Biology of the Testis"

M.L. Dufau (USA) and A. Isidori (I)
Majorca (E), September 13-14

"GTPase-Controlled Molecular Machines"

D. Corda and S. Garattini (I)
S. Maria Imbaro (I), Sept. 22-25

"Developmental Endocrinology"

M.L. Aubert and P.C. Sizonenko (CH)
Geneva (CH), Sept. 30 - Oct. 2

"The Challenge of Biotechnology: from Laboratory Diagnosis to Clinical Therapy"

S.A. Aaronson (USA) and R. Verna (I)
Rome (I), October 11-12

"Molecular Basis of Endocrine Diseases"

C. Pavia (E)
Barcelona (E), November 18-19

Gordon Research Conferences

Ares-Serono Symposia is pleased to announce its support of the Gordon Research Conferences in Italy for 1993.

"Biodegradable Polymers"

San Miniato (I), May 2-7

"Biological Structure and Gene Expression"

Volterra (I), May 2-7

"Organic Superconductors"

Il' Ciocco (I), May 9-14

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Mapping the Human Brain

A special two-day seminar at AAAS☆93, the annual meeting of the AAAS

Brain Mapping—Understanding Neurodegenerative Diseases: Alzheimer's Disease

Sunday, 14 February, 8:30 am-11:15 am

Session Chair: **Joseph B. Martin**, *Univ of Calif-San Francisco*

Joseph B. Martin, *Univ of Calif-San Francisco*

Introduction—The human brain mapping initiative

Leonard Berg, *Washington Univ School of Med*

Alzheimer's disease: The clinical and pathological syndrome

Kenneth S. Kosik, *Harvard Med School*

From the amyloid precursor protein to the plaques and tangles: Where does it go wrong?

Alison Goate, *Washington Univ School of Med*

Mutations in the amyloid precursor protein gene in Alzheimer's disease

Brad Hyman*, *Massachusetts General Hospital*

An analysis of the memory deficit in Alzheimer's disease

Donald L. Price, *Johns Hopkins Univ School of Med*

The biology of Alzheimer's disease: Lessons from studies of model systems

Cellular and Molecular Mechanisms of Memory Storage

Sunday, 14 February, 1:15 pm-2:15 pm

Keynote Address: **Eric R. Kandel**, *Columbia Univ College of Physicians & Surgeons/HHMI*

Perceiving the World: An Exploration of the Senses

Sunday, 14 February, 2:30 pm-5:00 pm

Session Chair: **David Van Essen***, *Calif Inst of Tech*

Randel Reed*, *Johns Hopkins Univ*

Genes involved in visual processing

John E. Dowling, *Harvard Univ*

Retinal processing of visual information

David Van Essen*, *Calif Inst of Tech*

Central processing of sensory information—the visual system

John S. Kauer, *New England Med Center/Tufts Med School*

Distributed representation of odor information: A paradigm for parallel neuronal processing

Stephen G. Lisberger, *Univ of Calif-San Francisco*

Sensory-motor processing for smooth eye movements

Memory and Learning: Lessons from Models

Monday, 15 February, 8:30 am-11:30 am

Session Chair: **Marcus Raichle***, *Washington Univ School of Med*

Larry R. Squire, *VA Medical Ctr/Univ of Calif-San Diego*

Brain systems and the structure of memory

Gary Lynch, *Univ of Calif-Irvine*

Biological origins and computational features of memory in brain networks

Marcus Raichle*, *Washington Univ School of Med*

Contributions of brain imaging to an understanding of brain areas involved in memory and learning

Endel Tulving, *Rotman Res Inst of Baycrest Center, Toronto*

How do we think about memory?

Panel discussion: Sharing the data involved in dissecting brain functions

Experience with Brain Mapping

Monday, 15 February, 1:15 pm-2:15 pm

Keynote Address: **Floyd E. Bloom**, *Scripps Res Inst*

Mapping Strategies

Monday, 15 February, 2:30 pm-5:30 pm

Session Chairs: **Constance M. Pechura**, *Inst of Med*; **Joseph B. Martin**, *Univ of Calif-San Francisco*

Robert Langridge*, *Univ of Calif-San Francisco*

Mapping molecules: Computations in time and space

Bruce R. Schatz, *Univ of Arizona*

Mapping organisms: From a worm genome to a human brain

Joseph Coyle*, *Harvard Med School*

A neuroscientist's view of the human brain

Vinton Cerf*, *Corporation for National Research Initiative*

A computer scientist's view of the human brain

Alan I. Leshner, *Natl Inst of Mental Health*

The Human Brain Project: The federal role

Panel discussion and concluding remarks

* Invited, not confirmed

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Important Notes

[1] **Seminar fee** covers admission to Mapping the Human Brain, but does not include admission to any other AAAS☆93 sessions. Registrations received after 22 January 1993 will not be processed, but you may register on site beginning 11 February. On-site rates are \$30 higher than advance rates for regular registration, \$10 higher for students, and \$20 higher for all others.

[2] **Special rates:** To qualify for student rate, you must attach a copy of your student ID card. To qualify for postdoc or K-12 teacher rate, you must provide the name and phone number of your department chairperson or principal in the space provided. *Registrations received without appropriate verification will be charged at the regular rates.*

[3] Cancellations must be received in writing by 22 January 1993. No refunds will be made for cancellations received after this date. Refunds are subject to a \$25 cancellation charge and will be processed after the seminar. BC

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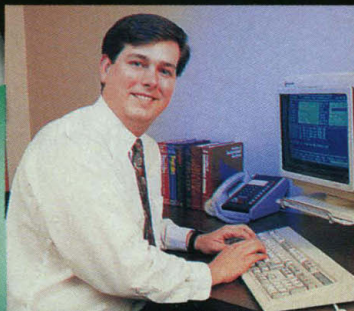
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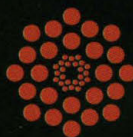


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The Winter Gordon Research Conferences will be held 4 January to 26 March at the Doubletree Hotel (telephone: 805-643-6000), 2055 Harbor Boulevard, Ventura, California, and at the Casa Sirena Resort (telephone: 805-985-6311), 3605 Peninsula Road, Oxnard, California. Attendance is limited—recommend applicants apply immediately for early consideration by Chair. Requests for applications to the Conferences, or additional information, address to: Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Gordon Research Center, University of Rhode Island, Kingston, Rhode Island 02881-0801. Telephone: 401-783-4011/3372, FAX: 401-783-7644; BITNET address: BCP101@URIACC.

There will also be Conferences held 2 to 14 May in San Miniato, Volterra, and Il Ciocco, Italy. Applications for these Conferences will be available in January 1993.

Agricultural Sciences

Casa Sirena Resort

S. W. Dumford, co-chair; R. M. Hollingworth, co-chair

25–29 January

Cytochrome P-450 mechanisms: E. Hodgson, discussion leader
F. P. Guengerich, "Cytochrome P-450: Chemical mechanism of catalysis."
P. R. Ortiz de Montellano, "Cytochrome P-450: Structure and mechanisms."

The author, director of the Gordon Research Conferences, is professor emeritus of chemistry, University of Rhode Island, Kingston 02881-0801.

E. Hodgson, "Interaction of agricultural chemicals with monooxygenases."

Cytochrome P-450 regulation: A. B. Okey, discussion leader

D. Nelson, "Evolution and genetics of cytochrome P-450."

A. B. Okey, "Mechanisms of cytochrome P-450 induction."

Vertebrate P-450s: Pesticide metabolism and risk assessment: R. M. Hollingworth, discussion leader

J. Chambers, "Cytochrome P-450-mediated metabolism of phosphorothionate insecticides and its significance in acute toxicity levels."

P. Levi, "Recent studies on the P-450-dependent metabolism and toxicology of herbicides."

TBA, "Activation of propesticides by cytochrome P-450."

Human cytochrome P-450 enzymes: TBA, discussion leader

F. J. Gonzalez, "The role of human cytochrome P-450 in cancer susceptibility and risk assessment."

J. A. Goldstein, "Characterization of human cytochrome P-4502Cs in a yeast cDNA expression system."

Physiological functions of insect P-450: R. Feyereisen, discussion leader

J. G. Scott, "House fly P-450 and pyrethroid resistance."

M. B. Cohen, "Multiple P-450 genes in the house fly."

L. C. Waters, "Molecular genetics of *Drosophila* P-450."

Poster session; J. Gressel, chair

Host plant relations involving insects and fungi: J. Menn, discussion leader

H. van Etten, "Cytochrome P-450 as a determinant of pathogen-host relations—the example of pisatin."

M. Schuler, "Cytochrome P-450 as a determinant of insect-host plant relations."

Microbial P-450s: E. Johnson, discussion leader

A. J. Fulco, "Barbiturate-mediated induction of microbial P-450s."

J. A. Peterson, "Structural and functional characterization of microbial P-450s."

E. F. Johnson, "Engineering mammalian P-450s: New substrate specifications and expression in *Escherichia coli*."

Plant cytochrome P-450 in plants: S.

Frear discussion leader

S. B. Powles, "Role of cytochrome P-450-mediated metabolism in herbicide resistance in evolved resistance weed species."

J. D. Metzger, "Role of cytochrome P-450 in plant growth regulator metabolism and activity in plants."

Plant cytochrome P-450 in plants

TBA, "Function, mechanism and regulation of P-450 enzymes in plants."

D. P. O'Keefe, "Structural and functional diversity of plant cytochrome P-450."

D. E. Moreland, "Role of cytochrome P-450 in herbicide metabolism and selectivity."

Alcohol (Biological Bases of Ethanol's Behavioral Effects)

Casa Sirena Resort

R. L. Alkana, chair; E. Mezey, vice chair

11–15 January

Mechanisms in search of ethanol-induced behaviors.

Ethanol sites of action and membrane protein behavior: K. W. Miller, discussion leader

N. Franks, "Binding versus perturbation: Evidence and relevance to understanding ethanol's mechanism of action and behavioral effects."

R. Hitzemann, "Lipid versus protein site for ethanol action. New evidence from NMR."

C. Stubbs, "Ethanol-sensitive sites on proteins and the role of lipids."

Posters: K. Kianmaa, A. D. Lê, discussion leaders

Cellular sites in search of ethanol-induced behaviors 1: Evidence linking dopaminergic systems to specific behavioral effects of ethanol.

Biological basis of addiction: Recent advances and concept of final common pathway: G. Kobb, discussion leader

F. Weiss, "Biological bases of alcoholism: Recent advances based on local administration and measurement."

M. S. Brodie, "Roles played by dopaminergic and noradrenergic systems in mediating ethanol's behavioral effects: Electrophysiological correlates."

J. M. Wehner, "Genetic predisposition to alcoholism: Potential use of transgenic and knock-out techniques to test hypotheses."

Cellular sites in search of ethanol-induced behaviors 2: Evidence linking serotonergic systems to specific behavioral effects of ethanol.

Role of specific serotonergic receptor subtypes in mediating behavioral effects of ethanol: E. Sellers, discussion leader

K. A. Grant, "Differentiating the role of serotonergic receptors in mediating the subjective and dependence producing effects of ethanol."

W. McBride, "Alcohol drinking behavior: Regulation by specific serotonergic pathways and receptor subtypes."

Cellular sites in search of ethanol-induced behaviors 3: Evidence linking GABAergic systems to specific behavioral effects of ethanol.

GABA receptors, subtypes and subunits: R. A. Harris, discussion leader

G. R. Breese, "Regional and neurotransmitter-specific effects of ethanol on brain and behavior: Evidence for direct effects of ethanol from local administration in vivo."

S. E. File, "GABA-serotonin link to ethanol withdrawal."

H. H. Yeh, "GABA_A receptor subunits: Relationship to specific behavioral effects of ethanol and basis for identifying chemical characteristics of ethanol-sensitive sites."

Cellular sites in search of ethanol-induced behaviors 4: Evidence linking other systems to specific behavioral effects of ethanol.

Adenosine, G proteins and ethanol: T. V. Dunwiddie, discussion leader

I. Diamond, "The role of adenosine receptors and transporters in mediating effects of ethanol."

B. Tabakoff, "Adenylate cyclase, phosphorylation and sensitivity of systems that control behavioral effects of ethanol."

Cellular sites in search of ethanol-induced behaviors 5: Evidence linking NMDA and calcium channel systems to specific behavioral effects of ethanol.

NMDA, calcium channels and ethanol's direct effects: P. Hoffman, J. Littleton, discussion leaders

H. Little, "Subtype considerations: Specific roles of voltage-gated and ligand-gated calcium ion channels in mediating ethanol's behavioral effects."

E. Michaelis, "Role of NMDA receptors in mediating developmental and pathological effects of ethanol on brain and behavior."

P. E. Chapman, "Nitric oxide: Intercellular messenger and possible site of ethanol action."

S. J. Smith, "Neuron-glia interactions and calcium ion metabolism: Possible site of ethanol action."

Banquet speaker: D. B. Goldstein

New techniques: Can they help us to ask better questions?

New imaging techniques: Can we use them in humans to link specific brain regions or neurotransmitters to specific behavioral effects of ethanol?: A. Pfefferbaum, discussion leader

TBA, "PET scan alters view of brain regional involvement in learning and memory: Relevance to ethanol research."

D. Ferster, "Patch clamp au naturel."

Role of steroids in mediating ethanol's behavioral effects: Twists to a new story.

Stress-ethanol interactions: R. Brinton, S. Zakhari, discussion leaders

E. R. de Kloet, "Neuroactive adrenal corticosteroids."

S. M. Paul, "Neurosteroids which modulate both inhibitory and excitatory neurotransmitters."

L. Swanson, "Stress-induced alterations of gene expression: Relevance to precipitating alcoholism."

Concluding statements: J. Littleton

Angiotensin

Casa Sirena Resort

W. F. Ganong, chair; M. Khosla, vice chair

8–12 February

Angiotensin converting enzyme: P. Corvol, discussion leader

F. Soubrier, "Angiotensin converting enzyme: Genetic aspects."

TBA

TBA

Function of angiotensin receptor subtypes: J. Saavedra, discussion leader

D. Tucker, "Receptor subtypes in embryonic and fetal myocardium."

R. Haberl, "Functional significance of angiotensin receptor subtypes in the brain microcirculation."

R. Pratt, "Role of angiotensin II receptor subtypes in neointimal proliferation."

The cardiac renin-angiotensin system: F. M. Bumpus, discussion leader

K. M. Baker, "Cardiac actions of angiotensins: Role of an intracardiac renin-angiotensin system."

K. T. Weber, "Myocardial remodeling and role of circulating and tissue renin-angiotensin system."

A. Husain, "The cardiac angiotensin II system in humans."

The renin-angiotensin system in reproduction and development: A. Husain, discussion leader

J. Tilly, "Role of growth factors and apoptosis in ovarian atresia."

C. R. Rosenfeld, "Vascular and uterine angiotensin II receptor subtypes in pregnancy."

G. Aguillera, "Developmental changes in the control of aldosterone secretion by angiotensin II and ACTH."

The brain renin-angiotensin system: F. A. O. Mendelsohn, discussion leader

C. Sernia, "Synthesis and secretion of brain angiotensinogen."

H. Imboden, "New findings on brain angiotensin using immunochemistry, isoelectric focusing, anti-idiotypic antibodies, and electrophysiological techniques."

J. Harding, "Angiotensin II (3-8) [ATV]: A unique signaling peptide."

ANP and other vasoactive peptides that interact with angiotensin: D. G. Gardner, discussion leader

M. Yanagisawa, "Molecular characterization of endothelin receptors."

D. Garbers, "The guanylyl cyclase receptors."

M. Humphreys, "ANP resistance in the nephrotic syndrome."

Genetic and transgenic approaches to the physiology and pathophysiology of the renin-angiotensin system: D. Ganten, discussion leader

T. Kurtz, "Finding new hypertension genes by linkage analysis in genetically hypertensive animals."

J. Wagner, "The generation of new animal models for hypertension research by transgenic techniques."

R. Mortensen, "Gene targeting to produce mutant cell lines."

(No session)—Banquet

Clinical aspects and implications of renin and angiotensin: G. Williams, discussion leader

R. P. Lifton, "Genes causing human hypertension."

N. Hollenberg, "Renal and adrenal dysfunction in hypertension."

E. Blaine, "Inhibitors of the renin-angiotensin system in clinical medicine."

Bioanalytical Sensors

Doubletree Hotel

G. S. Wilson, chair; F. S. Ligler, vice chair

22–26 March

Biological recognition

A. M. Klibanov, "Control of biorecognition by the reaction medium."

S. Kauffman, "Random generation of molecular receptors: Covering shape space."

R. Ekins, "Multianalyte binding assay: The need and the means."

Biological recognition

F. H. Arnold, "Protein recognition by metal-ion complexes and metal complexing polymers."

M. I. Greene, "Use of secondary structure to develop biologically active structures."

L. G. Bachas, "Recognition chemistry and biosensor response."

Novel devices

J. N. Zemel, "Sensor applications of micromachining and microfabrication."

C. R. Martin, "New ideas in biosensors and biocatalysis."

D. R. Walt, "Optical array microsensors."

Novel devices

R. S. Potember, "Demonstration of confined cultured neuroblastoma cells using chemically modified substrates."

D. A. Stenger, "Cell-based sensors for toxin detection."

W. G. Kuhr, "Implementation of dehydrogenase-modified microelectrodes for the measurement of glutamate neurotransmitter dynamics."

Signal transduction

Y. Umezawa, "Biosensing based on membrane proteins: Exploiting transmembrane signaling."

A. Heller, "Transduction of biochemical concentrations into electrical signals with electron relay-modified redox enzymes."

J. J. Kulys, "Integrated bioanalytical sensors based on carbon pastes."

Signal transduction

R. B. Thompson, "Phase fluorometric fiber optic chemical sensors."

R. Mikkelsen, "Sequence-selective biosensors for DNA based on hybridization indicators."

P. E. Laibinis, "Properties of self-assembled monolayers and their applications to sensor construction."

Surface biochemistry

B. D. Ratner, "Biocompatibility and biofouling."

D. E. Grainger, "Macromolecular assembly and organization of thin films on surfaces."

M. A. Arnold, "Critical evaluation of non-invasive glucose sensing."

Applications

J. D. Hamerslag, "Fabrication of multi-use disposable thick film ion selective electrodes for clinical applications."

S. Inbar, "Multilayer thin-film immunoassay."

J. C. Owicki, "A cell-based biosensor: From research through development."

There will be a series of "breakout" sessions where discussions on more specialized aspects can take place. Participants who wish to do so should bring a few slides or overheads. The topics for these sessions will include: What lessons have we learned from isfet/chemfet development? What do we mean by "ultrasensitive detection?" New materials for sensor applications. Biosensors as solutions to "real" problems. Effects of immobilization on biological activity. The complicated life of an immobilized protein. Additional topics may be suggested by participants.

There will be, in addition, a poster session scheduled for 2–3 evenings. Those wishing to participate should contact the vice chair, Dr. Frances S. Ligler, Center for Bio/Molecular Science and Engineering, Naval Research Laboratory, Washington, D.C. 20375. Telephone: 202-767-1681, FAX: 202-404-8688.

Biodegradable Polymers

San Miniato, Italy

S. J. Huang, chair; R. W. Lenz, vice chair

2–7 May

R. Lenz, A. Steinbuechel, discussion leaders

R. C. Fuller, R. W. Lenz, "Synthesis and degradation of unusual microbial polyesters."

Y. Doi, "The effects of composition and morphology on the biodegradation of microbial polyesters."

T. Saito, "Enzymatic degradation of polyhydroxy-alkanoates."

D. M. K. Cox, discussion leader

R. Marchessault, "Morphology and perspectives of microbial polyesters."

I. Noda, "Biodegradable polymers and their blends studied by 2D IR spectroscopy."

J. Mayer, L. Ambrosio, discussion leaders

B. Henrissat, "Cellulose biosynthesis and degradation."

E. Chiellini, "Polysaccharide hydrogels."

D. Kaplan, "Protein base biodegradable materials."

M. Rossi, discussion leader

H. Branch, "Enzymatic synthesis of polypeptides."

N. Ogata, M. Bitritto, discussion leaders

M. Vert, "Poly (hydroxy-esters)."

K. Leong, "Polyurethanes and polyphosphates."

G. Swift, "Degradable polycarboxylates."

D. Rutherford, R. Ottenbrite, discussion leaders

A. Takiyama, "Aliphatic polyesters."

J. Heller, "Polyorthoesters."

R. Dunn, discussion leader

J. Anderson, "Polyurethane biodegradation/biostability: Chemical, physical, and morphological interrelationships."

L. Nicolais, "Composites."

E. Goldberg, "Protein microspheres."

J. Hammer, R. Gross, discussion leaders

A. C. Albertsson, "Environmental degradation."

S. McCathy, "Processing and biodegradation."

R. Wool, R. Narayan, discussion leaders

C. Bastioli, "Starch-polymer blends of composites."

G. Loomis, "Enzymatic degradation of carbohydrate derivatives."

Biological Structure and Gene Expression

Volterra, Italy

M. Bissell and D. Ingber, co-chairs

2–7 May

Chromatin structure; D. Coffey, discussion leader

M. Bradbury, "Nucleosome and chromatin structure and functions."

L. Manuelidis, "Highlights of nuclear structure using molecular probes."

U. Aebi, "Exploring the 3-D molecular structure of the nuclear pore complex, a 125-MDa supramolecular machine mediating molecular trafficking across the nuclear envelope."

Higher order structure in transcriptional regulation: M. Beato, discussion leader

E. DiMauro, TBA

K. Yamamoto, "From simple signal to complex control: Networks and layers of transcriptional regulation."

Signal transduction—I: K. Dano, discussion leader

M. Bevilacqua, "Selectin carbohydrate interactions in inflammation and metastasis."

S. Tsukita, "Molecular mechanism for regulation of cadherin-based cell-cell adhesion."

D. Louvard, "Self-assembly processes and spatio-temporal controls involved in the generation of epithelial cells morphogenesis."

Nuclear matrix and nuclear structure: S. Penman, discussion leader

S. Georgatos, "Interactions of nuclear lamins with nuclear membrane."

R. Getzenberg, "Tissue-specific DNA organization and the nuclear matrix: Normal and cancer cells."

Signal transduction—II: G. Stein, discussion leader

H. Blau, TBA

P. Sassone-Corsi, "Signal transduction and gene control: The cAMP-pathway and the role of CREM."

C. Schmidhauser, "How do ECM-response elements work? Evidence for transcriptional enhancers involved in cell ECM interactions."

Cytoskeleton: D. Cleveland, discussion leader

E. Fuchs, "Insights into intermediate filament functions."

B. Geiger, "Transmembrane signaling in adherens-type junctions."

Determinant of cell structure and motility: A. B. Zeev, discussion leader

G. Albrecht-Buehler, "Infrared 'vision' of mammalian cells."

L. Goldstein, "Structure-function relationships of the kinesin motors."

J. P. Thiery, "Induction of epithelial cell plasticity and motility by growth factors."

Spatial integration and morphogenesis: C. Daniel, discussion leader

E. Boncinelli, TBA

T. Maciag, "Fibroblast growth factor: A multi-talented family."

Structural signaling: D. Ingber, discussion leader

P. Davies, "Mechanical signaling in endothelial cells."

S. Izumo, "Mechano-transcription coupling in cardiac myocytes."

T. Kupper, "Contraction and reorganization of collagenous tissues by $\alpha 2 \beta 1$."

Chemical Reactions at Surfaces

Doubletree Hotel

J. M. White, chair; R. J. Madix, vice chair

8–12 March

Structure, bonding and spectroscopy: J. T. Yates, Jr., discussion leader

J. T. Yates, Jr., "Overview of connections between structure, bonding and spectroscopy."

M. Chesters, "Surface structure and connections to reactions."

R. van Santen, "Chemical theory and its relation to reactions."

Structure, bonding and spectroscopy: J. T. Yates, Jr., discussion leader

E. Carter, "Theoretical insights into reactions on semiconductors."

Y. Chabal, "Vibrational spectroscopy: of adsorbate-semiconductor interfaces."

Reaction mechanisms: R. J. Madix, discussion leader

R. J. Madix, "Overview of reactions mechanisms."

R. Lambert, "Reaction mechanisms in catalytically interesting systems."

C. Friend, "The marriage of surface spectroscopy and physical organic chemistry."

Reaction mechanisms: R. J. Madix, discussion leader

M. Chisholm, "Reactions involving molecular metal alkoxide clusters."

B. Bent, "Mechanistic aspects of reactions of hydrocarbon fragments on metals."

Thermodynamics and kinetics: D. W. Goodman, discussion leader

D. W. Goodman, "Overview of thermodynamics and kinetics of surface reactions."

C. T. Campbell, "Energetics of surface reactions in the presence of additives."

W. H. Weinberg, "Chemistry at semiconductor interfaces."

Thermodynamics and kinetics: D. W. Goodman, discussion leader

S. Williams, "Kinetics of film growth from morphology."

T. W. Engel, "Reaction mechanisms at silicon surfaces."

Advances in techniques and quantitative measurements: A. Bradshaw, discussion leader

A. Bradshaw, "Overview of advances in techniques and quantitative measurements."

G. Scoles, "Molecular beam studies of organic surfaces."

R. Cavanagh, "Spectroscopic probing of ultrafast processes occurring at interfaces."

Advances in techniques and quantitative measurements: A. Bradshaw, discussion leader

J. Hemminger, "Spatial dependence and macroscopic kinetics of hydrocarbon reactions."

P. Avouris, "Inducing and probing surface reactions on the atomic scale with STM."

Opportunities and new approaches: C. B. Duke, discussion leader

S. J. Riley, "Chemical reactions on isolated transition metal clusters."

J. E. Houston, "Force microscopy studies of chemical and mechanical properties of organic monolayers."

J. J. Pireaux, "Probing chemical processes at polymer surfaces."

Chemotherapy of AIDS

Casa Sirena Resort

J. Martin, chair; M-C. Hsu, vice chair

22-26 March

General strategies: V. E. Marquez, discussion leader

E. De Clercq, "Targeted action of anti-HIV agents: New advances."

J. Saunders, "Mechanistic approaches to HIV drug discovery."

M. Gait, "TAT-tar and REV-rre interactions: Important targets for HIV drug design."

Clinical research: M. J. M. Hitchcock, discussion leader

R. Yarchoan, "New advances in the therapy of AIDS and Kaposi's sarcoma."

Reverse transcriptase: H. Mitsuya, discussion leader

E. Arnold, "3-D structure of HIV-1 reverse transcriptase complexed with a double-stranded DNA template primer."

W. G. Tarpley, "Resistance development to nonnucleoside HIV-1 RT inhibitors reveals type-specific characteristics."

P. Furman, "Biochemistry of HIV-1 re-

verse transcriptase containing mutations associated with drug resistance."

Reverse transcriptase: Y-C. Cheng, discussion leader

L. M. Dunkle, "D4T: Clinical development of a promising antiretroviral agent."

A. Fridland, "Cellular determinants of efficacy of nucleoside and nucleotide drugs."

Biological approaches: C. W. Dieffenbach, discussion leader

E. A. Emini, "The prevention of HIV-1 infection by immunological and chemical prophylaxis."

J. F. Warner, "Induction of HIV-specific immune responses using retroviral vectors."

Clinical research: M. J. Johnston, discussion leader

H. C. Lane, "Immunological approaches to the treatment of HIV infection."

D. Hoth, "HIV vaccines: Present status and future prospects."

Targets for therapy: M-C. Hsu, discussion leader

M. Auer, "Discovery of inhibitors of REV/RRE interaction."

P. O. Brown, "Integrase."

M. Rosenberg, "Screening and design approaches using HIV molecular targets."

Clinical research: J. S. Driscoll, discussion leader

L. Corey, "Where is the therapy of HIV infection?"

Protease: D. C. Baker, discussion leader

D. J. Kempf, "Inhibitors of HIV protease."

N. A. Roberts, "Update on the status of Ro 318959."

J. R. Huff, "Development of HIV protease inhibitors."

Composites

Doubletree Hotel

A. F. Yee, chair; N. Johnston, vice chair

11-15 January

W. Schultz, discussion leader

J. Crivello, "UV and E-beam curable composites."

B. Novak, "Mutually interpenetrating inorganic-organic networks, new routes into nonshrinking sol-gel composite materials."

S. Sternstein, discussion leader

D. Chung, "Composites for electronic packaging."

R. Farris, "Shrinkage stress in polymeric materials as a function of the degree of constraint."

A. Okada, discussion leader

T. Pinnavaia, "Clay-epoxy nanocomposites."

E. Giannelis, "Polymer nanocomposites."

E. Chen, discussion leader

G. Tibbetts, "Carbon fibers from natural gas: Production, properties and applications."

R. Young, "Deformation micromechanics in high modulus fibers and composites."

Y. W. Mai, discussion leader

D. Srolovitz, "Simulated microstructural effects in fracture."

K. Friedrich, "On polymer composites with high wear resistance."

D. Grande, discussion leader

O. Bauchau, "Design of composite sandwich structure."

V. Li, "Passive smart brittle matrix composites."

J. G. Williams, discussion leader

D. Hull, "Energy absorbing composite structures."

M. Maier, "Crash and energy absorption behaviour of composite structures—numerical simulation and experimental results."

N. Johnston, discussion leader

L. Ilciewicz, "Technical issues to address in applying advanced composite materials to transport aircraft structures."

M. Grayson, discussion leader

C. Lee, "Thermal oxidative stability lifetime prediction for polymer composites."

D. Ward, "Durability issues for high-temperature polymeric matrix composites."

Crystal Growth

Casa Sirena Resort

M. E. Glicksman, chair; P. A. Morris, vice chair

15-19 March

Crystal growth fundamentals I: S. Coriell, discussion leader

R. F. Sekerka, "Crystal growth with anisotropic interface kinetics and surface tension."

R. D. Mountain, "Simulation studies of nucleation and growth."

F. Rosenberger, "Kinetics and morphology of protein crystal growth."

Poster introductions: R. Andrews, P. Morris, discussion leaders

Crystal growth fundamentals II: I. Alexander, discussion leader

A. A. Wheeler, "Phase-field models of binary crystal growth."

J. J. Derby, "Large-scale computational modeling of bulk crystal growth processes."

Crystal growth and defects in high T_c cuprate superconductors I: S. Wolf, discussion leader

T. Vanderah, "Growth and characterization of HTS single crystals: Do we know what we're doing?"

Y. Hidaka, "Recent developments on high T_c superconductor crystal growth."

J. Eckstein, "Atomic layer-by-layer growth of high T_c cuprate thin films and heterostructures."

Crystal growth and defects in cuprate superconductors II: R. Mazelsky, discussion leader

J. Rice, "Growth and characterization of untwinned $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ single crystals."

Th. Wolf, "Growth of large $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ single crystals."

Oxide crystals: P. Morris, discussion leader

A. Kingon, "Growth of epitaxial oxide films from the vapor."

P. Bordui, "Oxide crystal growth from high-temperature solutions."

M. Roth, "Growth and optical characterization of BBO."

Characterization of advanced photonic crystals: D. Brandle, discussion leader

M. Fejer, "Materials for nonlinear frequency conversion."

M. Gottlieb, "Growth of acousto-optic crystals: Assessing operational characteristics."

E. Van Stryland, "Novel techniques for the characterization of NLO crystals."

Wide band gap semiconductor crystal growth: R. Hopkins, discussion leader

D. L. Barrett, "Advances in the growth of single crystal SiC."

TBA, "Crystal growth technology of boron nitrides."

TBA, "CVD growth of diamond film."

Atomic ordering and scanning probe microscopy: N. B. Singh, discussion leader

S. Mahajan, "Atomic ordering in semiconductor crystals."

R. S. Howland, "Applications of scanning probe microscopy to crystal growth."

Doping phenomena in III-V and II-VI multinary semiconductor crystals: M. Digiluseppe, discussion leader

R. Gunshor, "Epitaxial ZnSe-based structures for electroluminescent devices."

C. Abernathy, "Carbon doping in GaAs and related compounds."

D. Ritter, "High doping effects during metal-organic molecular beam epitaxy of InP and GaInAs."

Electrochemistry

Doubletree Hotel

A. Diaz, chair; C. M. Elliot, vice chair

18-22 January

N. Lewis, discussion leader

R. M. Wightman, "Electrochemical sensing of chemical secretion from individual biological cells."

A. G. Ewing, "Development and characterization of electrodes for applications in biological microenvironments."

J. Pemberton, discussion leader

W. R. Heineman, "Electrochemical immunoassay: Zeptomole detection limits."

R. L. McCreary, "Structural basis of carbon electrode behavior."

R. Fawcett, discussion leader

M. R. Philpott, "Adsorption dynamics (fsee to nsee) of hydrated ions on charged electrodes by computer simulations."

M. D. Newton, "Mechanisms for long-range donor/acceptor interactions."

J. Facci, discussion leader

J. Anderson, "Surface charging in polymers."

D. T. Smith, "Spontaneous charge transfer at dissimilar insulator interfaces."

C. R. Martin, discussion leader

A. R. Hillman, "Mobile species transfer and polymer relaxation processes in conducting polymers."

J. C. Grenier, "Electrochemical oxygen insertion into oxide networks."

H. N. Blount, discussion leader

R. M. Crooks, "Probe molecules and organized monolayers: A basis for molecular recognition."

S. E. Creager, "Tunneling microscopy and spectroscopy of molecular materials."

C. Korseniewski, "IR spectroscopy as a probe of adsorption and catalysis at the electrode-solution interface."

C. R. Cabrera, "In situ mass and charge measurements with the quartz microbalance."

J. G. Gordon, discussion leader

M. Verbrugge, "Investigating high rate deposition processes using microelectrodes."

E. J. M. O'Sullivan, "New results in electrodeless deposition of thin barrier films and their properties."

C. M. Elliot, discussion leader
Open session

R. Brodd, discussion leader

M. A. Fetcenko, "Disordered materials for use as metal hydride electrodes."

G-A. Nazri, "Material aspects of rechargeable lithium batteries."

Enzyme Organization and Cell Function

Casa Sirena Resort

H. Knoll, chair; M. Deutscher, vice chair

18–22 January

Cellular microenvironments: R. Lynch, discussion leader

J. Clegg, "The suborganelle level of animal cell cytoplasm: Experiments and reflections."

K. Luby-Phelps, "Functional compartmentation of cytoarchitecture."

L. Pagliaro, "Glycolytic enzyme dynamics in living cells."

Kinetic evaluation of interactions: R. Welch, discussion leader

J. F. Hervegault, "Modeling of the kinetic and spatiotemporal behavior of an ambiquitous enzyme: The phosphofructokinase system."

D. K. Srivastava, "Physical determinants of recognition among biological molecules."

Dynamics of microcompartmentation: C. Aflalo, discussion leader

J. Wilson, "Interactions between mitochondrial and cytoplasmic metabolism, mediated by mitochondrially bound hexokinase."

P. Low, "Binding and regulation of glycolytic enzymes by erythrocyte band 3."

M. Schaller, "Tyrosine kinase: SH2-containing proteins and topology of cellular adhesions."

Enzyme organization in intermediary metabolism: D. Kell, discussion leader

L. Fahien, "Role of large mitochondrial matrix enzymes in organizing other mitochondrial enzymes."

F. Opperdos, "Compartmentation of glycolysis in trypanosomes."

Enzyme organization in macromolecular metabolism: H. Smith, discussion leader

P. Grabowski, "Factors and mechanisms governing alternative splicing of pre-mRNA."

M. Deutscher, "Channeling and enzyme organization in the protein synthesizing system."

C. McHenry, "DNA polymerase III holoenzyme: Structure and mechanism of a replicative complex."

Metabolite channeling: M. Berry, discussion leader

N. Cohen, "Organization of soluble enzymes of the urea cycle."

D. Sherry, "¹³C NMR evidence for tight substrate channeling of TCA cycle intermediates in mammalian tissues."

Localized synthesis and trafficking: L. Brunton, discussion leader

R. Singer, "The intracellular spatial distribution of RNA as a component gene expression."

M. Scheetz, "Mechanisms of control of organelle motility."

L. B. Chen, "Tensin, an actin-binding protein in signal transduction."

Physical chemistry approaches to heterogeneous interactions: P. Hensley, discussion leader

A. Minton, "Macromolecular crowding, confinement and metabolic organization."

TBA, "The use of biacore in studying interactions."

Genetic and other approaches to interactions: C. Slaughter, discussion leader
P. Bartel, "The two hybrid system for detection of protein-protein interactions."

K. Brindle, "A combined NMR and molecular genetic approach to studying the properties of enzymes in vivo."

D. Appling, "Molecular genetic approaches to evaluate enzyme organization in the purine biosynthesis pathway."

Fibronectin

Casa Sirena Resort

M. H. Ginsberg, chair; J. E. Schwarzbauer, vice chair

15–19 February

Structure-function of nectins and integrins: K. Yamada, discussion leader

J. Schwarzbauer, "Mutational analysis of fibronectin."

R. Burgeson, "Functions of kallinin (epiligrin)."

J. Loftus, "Ligand-binding domains of integrins."

Three-dimensional structure of nectins: M. Mosesson, discussion leader

H. Erickson, "Crystallographic structures."

I. Campbell, "NMR structure of fibronectin modules."

K. Ely, "Ligand-mimetic antibodies."

Matrix regulation of growth and function: E. Ruoslahti, discussion leader

M. Beckerle, "Zyxin, zinc fingers at the junction."

C. Buck, "Implantation."

M. Schwartz, "Signaling."

Integrins as intracellular receptors: M. Hemler, discussion leader

E. Brown, "Integrin-associated protein."

A. F. Horwitz, "Mutational analysis of cytoplasmic domains."

Biological integration of adhesive signals: L. Reichardt, discussion leader

R. Isberg, "Bacterial pathogenesis."

C. Damsky, "Placental development."

D. Cheresh, "Plant integrins."

Integrin antagonists: D. Mosher, discussion leader

J. Lawler, "Thrombospondin."

K. Crossin, "Cytotactin."

Molecular genetic analysis of nectins and integrins: R. O. Hynes, discussion leader

D. Fristrom, "*Drosophila* integrins."

D. Dean, "Transcriptional regulation of integrins."

D. Wagner, "Disruption of selectin genes."

H. Bourne, "How do membrane proteins speak to the cytoplasm and extracellular space?"

Modulation of integrin function: S. Shattil, discussion leader

J. T. Parsons, "Tyrosine kinases."

L. Parise, "Dynamic control of $\alpha_{IIb}\beta_3$."

C. Figdor, "Modulation of β_1 and β_2 integrins."

Novel integrins and variants: R. Pytela, V. Quaranta, discussion leaders

Biotechnology: M. Pierschbacher, D. Phillips, M. Gallatin, discussion leaders

Glycoproteins and Glycolipids

Doubletree Hotel

J. U. Baenziger, chair; A. Varki, vice chair

8–12 February

N- and O-glycosylation: R. Hill, discussion leader

R. Gilmore, "Purification of the oligosaccharyltransferase complex."

L. Lehle, "Cloning of the yeast oligosaccharyltransferase."

G. Hart, "Cytoplasmic glycosylation is ubiquitous and dynamic."

Glycosyltransferase genes: M. Ferguson, discussion leader

P. Stanley, "Glycosyltransferase genes and their products."

J. B. Lowe, "Structure and expression of mammalian glycosyltransferase genes."

Phosphatidylinositol glycans and intracellular glycosylation: G. Hart, discussion leader

M. Ferguson, "The glycosyl-phosphatidylinositol family."

G. Stacey, "Lipo-oligosaccharide signals essential for *Rhizobium* legume interaction."

P. Orlean, "Development of yeast as a system to explore the synthesis and function of glycopospho inositol membrane anchors."

The role of sialic acid in disease and development: A. Varki, discussion leader

S. Schenkman, "The trans-sialidase of *Trypanosoma cruzi*."

R. Rutishauser, "Regulation of cell interactions by polysialic acid."

Carbohydrate recognition: S. Kornfeld, discussion leader

C. A. A. van Boeckel, "From heparin to potent non-glycosaminoglycan analogues."

C. Schubert Wright, "Multisite interaction of WGA with a glycophorin sialoglycopeptide."

K. Drickamer, "Ca²⁺-dependent carbohydrate recognition domains in animal lectins."

Glycolipid synthesis and function: J. Esko, discussion leader

R. Ghidoni, "The role of Golgi in the elongation of ganglioside oligosaccharide chains."

S. Spiegel, "The role of ganglioside GM1 in cell growth regulation and transmembrane signaling."

Selectins and cellular adhesion: K. Drickamer, discussion leader

R. McEver, "Leukocyte interactions with selectins."

L. Lasky, "Selectin lectins."

R. Cummings, "Endogenous ligands and cell adhesion."

Glycosaminoglycan synthesis and function in growth regulation: J. Lowe, discussion leader

J. Esko, "Saccharide-based inhibitors of proteoglycan synthesis."

I. Vlodavsky, "Growth factor interactions with heparin and heparin sulfate proteoglycans."

C. Hirschberg, "Cloning and expression of N-heparin sulfate sulfotransferase."

The role of terminal phosphate and sulfate: C. Hirschberg, discussion leader

O. Hindsgaul, "Carbohydrate chemistry yields new tools to study the function of cell surface glycosylation."

S. Kornfeld, "Use of "shuffle" mutagenesis to define the lysosomal enzyme recognition marker for N-acetylglucosaminyl-phosphotransferase."

J. U. Baenziger, "Peptide determinants of the glycoproteins-hormone specific N-acetylgalactosamine-transferase."

Immunobiology/Immunochemistry

Casa Sirena Resort

A. M. Kruisbeek, chair; C. B. Thompson, vice chair

8–12 March

M. K. Jenkins, discussion leader

R. A. Flavell, "Costimulator transgenic mice."

J. Miller, "Costimulation and the regulation of the IL-2 gene."

J. A. Bluestone, "Long-term donor-specific tolerance in organ transplantation induced by CTLA4lg."

E. C. Butcher, discussion leader

S. Shaw, "T cell adhesion cascades: Importance of chemokines."

G. A. van Seventer, "Multiple costimulatory adhesion pathways involved in human T cell activation. A redundancy or a necessity."

L. H. Glimcher, discussion leader

M. J. Owen, "Regulation of TCR-B gene expression."

K. L. Calame, "Analysis of Ig gene transcription."

J. Leiden, "Transcriptional regulation of T cell development."

B. Osborne, discussion leader

D. R. Green, "Oncogenes and their role in apoptosis."

P. H. Krammer, "APO-1-mediated apoptosis."

R. L. Noelle, discussion leader

G. Kelsoe, "B cell mutations and population genetics in germinal centers."

J. A. Ledbetter, "B cell activation by CD20 ligation: Stable association of CD20 with tyrosine and serine kinases."

TBA

W. E. Seaman, discussion leader

W. M. Yokoyama, "Ly-49-mediated recognition of class I MHC."

D. H. Raulet, "Mechanisms of MHC-mediated suppression of lysis by NK cells."

B. E. Bierer, discussion leader

G. R. Crabtree, "Signal transmission in T cells."

N. H. Sigal, "The role of calcineurin in the immunosuppressant and toxic action of FK506."

J. Heitman, "Studies on immunosuppressant and immunophilin action in yeast."

H. L. Ploegh, discussion leader

P. Ashton-Rickardt, "Gene targeting as a tool to unravel class I restricted antigen presentation."

H. L. Ploegh, "Biosynthesis of MHC class I molecules."

B. R. Bloom, discussion leader

M. Neutra, "Trans epithelial transport of antigens and pathogens to the mucosal immune system in the gut."

R. Locksley, "Immunoregulation in leishmaniasis."

B. R. Bloom, "Insights into immunoregulation from leprosy."

Kallikreins and Kinins

Doubletree Hotel

A. G. Scicli, chair; D. Proud, vice chair

22-26 February

Kinin receptors and kinin antagonists: D. Regoli, discussion leader

D. Sawatz, "Discovery and in vitro biological activity of nonpeptide bradykinin receptor antagonists."

K. Jarnagin, "Features of the B₂ kinin receptor gene. Effects of site-directed mutagenesis on activity."

T. Stormann, "Utilization of chimeric receptors and site-directed mutagenesis to define the agonist and antagonist binding sites of the rat and human bradykinin B₂ receptors."

F. Leeb-Lundberg, "Intracellular processing of the internalized kinin receptor."

Allergy and inflammation: D. Proud, discussion leader

W. Rajakulasingam, "Kinins in allergic asthma."

J. Bathon, "Modulation of kinin responsiveness in human synovial cells by interleukin-1."

V. Seybold, "Substance P receptor regulation."

The kinin connections: A. Nasjletti, discussion leader

M. Marletta, "Biochemistry of NO formation."

R. Levy, "Bradykinin-induced relaxation of the coronary circulation. Mechanisms."

R. Busse, "Responses of endothelial cells to kinins: Role of kininase inhibitors."

L. Ignarro, "Signal transduction pathways involving nitric oxide and cyclic GMP."

A. Cuthbert, discussion leader

S. Schwartz, "Vascular responses to injury."

B. S. Dixon, "Transmembrane signaling by kinins in vascular smooth muscle: Comparisons and contrasts with angiotensin II."

C. Van Breemen, "Dependence of endothelial responses to bradykinin on membrane potential."

Peptidases: old and new: P. Ward, discussion leader

S. Wilks, "Multicatalytic proteinase complex (proteasome): Properties and functional significance."

M. Orlowski, "Endopeptidase 24.15. Specificity, structure, inhibitors and possible function."

E. Erdős, "Carboxypeptidase M: Specificity and function."

W. Simmons, "Relative importance of lung kininases other than ACE."

Round table on the clinical use of kinin receptor antagonists: J. Stewart, moderator

D. Proud, L. Steranka, E. Whalley, N. Bender

R. Mayfield, discussion leader

O. A. Carretero, "Renal and cardiovascular effects of an inhibitor of NEP 24.15."

E. J. Sybertz, "ANP and kinins: Vascular and renal actions of inhibitors of NEP 24.11."

J. Garvin, "Kinins and EDRF in the regulation of ionic transport in collecting duct epithelial cells."

Kinin receptor antagonists in vivo studies: O. A. Carretero, discussion leader

B. Schölkens, "Role of kinins in regula-

tion of coronary blood flow and cardiac function."

T. Unger, "Kinin contribution to the cardiovascular effects of ACEi."

B. Zimmerman, "Kinins in the regulation of renal function."

H. Margolius, "Kinins as modulators of salt-sensitive hypertension."

Proteases and protease inhibitors: L. Greenbaum, discussion leader

J. Travis, "Structure and functions of serpins: Evidence for multiple roles in homeostasis."

M. Jochum, "Proteinase inhibitor therapy in acute inflammatory diseases."

L. Chao, "Transgenic analysis of tissue kallikrein function."

Plasma kallikrein and kininogens: R. Colman, discussion leader

R. Colman, "New functions of an old protein."

A. Schmaier, "Mechanisms of intravascular expression of the kininogens."

D. Mosher, "Kininogens as potential regulators of cell adhesion to injured tissues."

R. Harris, "Structural analysis of the selected binding domains of HMW-kininogen."

Magnesium in Biochemical Processes

Casa Sirena Resort

C. H. Fry, chair; M. E. Maguire, vice chair

22-26 February

Magnesium transport in different cellular systems: G. Quamme, discussion leader

P. Flatman, "Magnesium transport in red cells."

A. Scarpa, "Hormonal regulation of cell Mg²⁺ homeostasis."

H. Rasgado-Flores, "Coupled fluxes of Mg²⁺, Na⁺, K⁺ and Cl⁻ in excitable cells."

Molecular aspects of magnesium transport: K. Beyenbach, discussion leader

M. Maguire, "Topology and regulation of S. typhimurium Mg²⁺ transport systems."

R. Preston, "Genetic manipulation of magnesium current and behavior in paramecium."

The influence of magnesium on membrane transport: P. Flatman, discussion leader

K. Beyenbach, TBA

J. Hoffman, "Magnesium, DPG, Na/K/Cl cotransport and cell volume regulation."

J. H. Steinbach, TBA

Magnesium and the cardiovascular system—clinical aspects: B. Altura, discussion leader

T. Millane, "Magnesium and the limitation of infarct size."

R. Rude, "Magnesium and arrhythmias."

Magnesium and the cardiovascular system—basic aspects: C. Fry, discussion leader

S. Hall, "Magnesium and cardiac function."

C. Hartzell, "Magnesium and cardiac Ca²⁺ currents."

B. Altura, "Magnesium and vascular smooth muscle."

Magnesium and urinary tract stones: C. Fry, discussion leader

S. Holmes, "Formation of magnesium-containing stones in the urinary tract."

J. Kavanagh, "Magnesium and inhibitors of stone formation."

Epithelial transport: M. Maguire, discussion leader

G. Quamme, "Overview of renal Mg²⁺ handling and its controls by physical factors."

C. de Rouffignac, "Hormonal control of renal Mg²⁺ transport."

J. Fordtran, "Intestinal magnesium absorption."

Magnesium and pregnancy: J. McGuigan, discussion leader

C. Sibley, "Placental transfer of Mg²⁺ and other ions."

C. Sachs, "Magnesium in essential fluids."

Measurement of intracellular and extracellular magnesium: J. McGuigan, discussion leader

U. Spichiger, "The development of Mg²⁺-selective probes."

E. Murphy, "Mg²⁺-selective measuring systems."

J. McGuigan, "Measurement of intracellular magnesium."

Mammalian DNA Repair

Doubletree Hotel

J. E. Cleaver, chair; M. J. Smerdon, vice chair

1-5 February

M. J. Smerdon, discussion leader

C. Selby, "Mechanism of coupling between transcription and repair in *E. coli*."

G. Kantor, "Identification of specific repair domains in normal human and xeroderma pigmentosum group C cells."

G. Holmquist, "Damage and repair of cyclobutane pyrimidine dimers at the junction of transcription initiation in the promoter and first exon of PGMK1."

C. W. Lawrence, discussion leader

C. W. Lawrence, "Experiments with oligomers that carry a single defined UV photoproduct."

J. S. Taylor, "Pyrimidine dimer structure-activity relationships."

W. Summers, discussion leader

C. Hollander, "The gadd genes—potential roles in growth arrest following DNA damage."

M. Protic, "Regulation of damage-specific DNA-binding proteins from mammalian cells."

W. Summers, "The signaling pathway for damage-inducible genes."

H. Evans, discussion leader

P. Jeggo, "Progress in cloning the gene responsible for x-ray sensitivity in xrs cells and understanding its function."

J. Thacker, "Repair of site-specific DNA double strand breaks by human cells and cell extracts."

M. C. Paterson, discussion leader

R. Athwal, "Identification of chromosome locations of DNA repair genes."

M. Buchwald, "Genetic and molecular analysis of Fanconi anemia."

J. Murnane, "Ataxia telangiectasia."

R. Legerski, discussion leader

S. Lloyd, "Genes for cyclobutane dimer and (6-4) photoproduct repair in XP group A."

M. C. Paterson, "Intermediates in processing of cyclobutyl pyrimidine dimers in human cells."

G. Adair, discussion leader

J. Latimer, "The ERCC1 UV repair gene."

J. Hoelmakers, "The ERCC3/XPB/CXC gene."

K. Tanaka, "The XPAC UV repair gene."

J. E. Cleaver, discussion leader

M. Sekiguchi, "The O⁶ alkyl transferase gene."

D. Karentz, "Ultraviolet exposure and potential DNA damage under the antarctic ozone 'hole'."

J. Regan, discussion leader

D. Mount, "DNA repair in the plant *Arabidopsis thaliana*."

J. Boyd, "Repair genes in *Drosophila melanogaster*."

P. Hartman, "Two tales of *Caenorhabditis elegans*: UV radiation mutagenesis and damage-resistant DNA synthesis."

Metals in Biology

Doubletree Hotel

E. I. Stiefel, chair; J. T. Groves, vice chair

25-29 January

J. T. Groves, discussion leader

B. L. Haymore, "Engineering metal-mediated control of enzymic activity."

J. P. Caradonna, "Probing old sites with new proteins: Theory and experiment."

R. Ghadiri, "Self-organizing processes in the de novo design of metalloproteins."

T. Handel, "Design of metal binding four-helix bundles."

B. M. Hoffman, discussion leader

H. B. Gray, "Electron tunneling in proteins."

P. L. Dutton, "Electron transfer in biological charge separation."

S. J. Lippard, discussion leader

S. G. Sligar, "Electron transfer and oxygen activation by P-450."

G. T. Babcock, "Discrete steps in dioxygen activation: The cytochrome oxidase O₂ reaction."

K. D. Karlin, "Dioxygen binding and activation with copper and porphyrin-iron complexes."

K. Wieghardt, "Model complexes for non-heme iron and manganese metalloproteins."

R. B. Frankel, discussion leader

S. Mann, "Controlled synthesis of nanophase bioinorganic materials in supramolecular ferritin cages."

J. L. Kirschvink, "Magnetite (Fe₃O₄) biomineralization in the human brain."

T. G. Spiro, discussion leader

T. L. Poulos, "The crystal structure of lignin peroxidase."

M. Tien, "Enzymology of lignin and manganese peroxidases."

G. Smulevich, "Structural interactions in the peroxidase superfamily."

J. S. Valentine, "Redesign of yeast Cu-Zn superoxide dismutase."

D. M. Dooley, discussion leader

D. Riley, "Functional mimics of manganese superoxide dismutases as pharmaceuticals."

M. A. Marletta, "Nitric oxide synthase: Function and mechanism."

W. E. Newton, discussion leader

D. C. Rees, "Nitrogenase crystal structure."

D. R. Dean, "Nitrogenase genetics."

E. Münck, "Spectroscopic studies of nitrogenase: What have we learned?"

R. H. Holm, "Heterometallic cubane-type clusters."

P. Saltman, discussion leader

Open discussion, "Future trends in 'metals in biology' and education."

J. E. Coleman, D. M. Dooley, H. B. Gray, T. G. Spiro, speakers
O. Gansow, discussion leader
T. J. McMurtry, "Chelating agents for use in radioimmune therapy."
M. J. Abrams, "Recent developments in Pt anti-cancer compounds."
A. Davison, "Technetium radiopharmaceuticals: Past and future."
M. F. Tweedle, "Metal chelate contrast agents in magnetic resonance imaging."

Molecular Pharmacology

Casa Sirena Resort

L. E. Limbird, chair; G. L. Johnson, vice chair

1-5 March

Chemical and Electrical Messages for Signal Transduction

Genetic strategies to reveal the structure and functioning of diverse voltage-gated ion channels: B. Tempel, discussion leader

B. Tempel, "K⁺ channel genes in normal and mutant mice."

K. Beam, "Analysis of Ca²⁺-channel structure and function in the mdg dysgenic mouse."

M. Welch, "Cystic fibrosis gene: Chloride channel or CFTR regulator?"

L. Jan, "Structure-function studies on voltage-regulated K⁺ channels in *Drosophila*."

Structure and function of multisubunit, ligand-gated ion channels; R. Dingledine, discussion leader

R. Dingledine, "Structural basis for calcium permeation in NMDA and non-NMDA glutamate receptors."

Z. Hall, "Structure and assembly of the nicotinic acetylcholine receptor."

K. Angelides, "Assembly of GABA receptor subunit isoforms determines sorting and localization."

N. Unwin, "The nicotinic acetylcholine receptor at 9 Å resolution."

The unique functional strategies for signal transduction and desensitization through seven transmembrane-spanning receptors: L. Limbird, discussion leader

L. Zipursky, "The seven transmembrane spanning bride of *sevenless* ligand and the *sevenless* tyrosine kinase it activates in development of the *Drosophila* eye."

S. Coughlin, "The mechanisms for thrombin receptor signaling."

J. Thorner, "The molecular mechanisms for receptor desensitization at yeast pheromone receptors."

M. Lohse, "Regulation of G-protein function by phospholipase and its homologs."

The molecular mechanisms underlying receptor maturation, targeting and turnover: E. Ross, discussion leader

B. Kobilka, "Intracellular transport and targeting of adrenergic receptors."

J. Keefer, "Molecular determinants for the polarized expression of α_2 -adrenergic receptors in renal epithelial cells."

S. Mumby, "Lipid modifications and membrane localization of G-proteins."

Heterotrimeric GTPases and new pathways/mechanisms of signal transduction: G. Johnson, discussion leader

C. Berlot, "G-protein α subunit structure."

E. Ross, "Regulatory consequences of the Gq GAP activity of phospholipase C- β 's."

J. Pouyssegur, "G-protein-regulated cell proliferation."

G. Johnson, "Consequences of dominant mutant G-protein expression."

U. Rudolph, "Targeted inactivation of Gi α_2 subunits in mice."

Low molecular weight GTP-binding proteins and their role in trafficking and integrating cell surface-initiated signal transduction: Y. Kaziro, discussion leader

Y. Kaziro, "ras functions in growth factor action."

R. Cerione, "GTPase and tyrosine kinases."

K. Mostov, "Interplay of small and heterotrimeric GTPase systems."

Signal transduction in sensory systems: R. Reed, discussion leader

R. Reed, "Olfactory signal transduction."

C. Zuker, "Genetic and biochemical analysis of phototransduction in *Drosophila*."

S. Bergman, "Olfaction in *C. elegans*."

C. Bergman, TBA

G. Rubin, "Signal transduction and cell fate determination in the *Drosophila* eye."

Signal transduction cascades linking tyrosine phosphorylation/dephosphorylation events with members of the GTPase superfamily: J. Brugge, discussion leader

J. Brugge, "Src signal transduction in neuronal differentiation."

O. Witte, "Bcr regulation of c-Abl."

A. Kazlauskas, "Signal transduction by the PDGF receptor."

N. Ahn, "Growth factor activation of mitogen-activated protein kinase."

Polymers (west)

Doubletree Hotel

H. Yu, chair; J. Pochan, vice chair

4-8 January

H. Yu, discussion leader

G. Weill, "Chain dynamics in DNA pulsed field gel electrophoresis—stretching and overstretching."

J. Colmenero, "Probing α -relaxation process by various scattering and relaxation techniques: PVME, PH, PVC and PVAc."

T. Kotaka, "Polymer chain relaxation via dielectric spectroscopy."

P. Kopelman, discussion leader

D. Schaefer, "Fractal concepts in complex polymer systems."

E. T. Samulski, discussion leader

C. Ober, "Melt dynamics and phase behaviors or thermotropic polymers."

J. Reynolds, "Structure and properties of electrically conducting and electroactive polyheterocycles."

M. Winokur, "Structural order of a conducting polymer, poly(3-alkylthiophene)s."

M. Tirrell, discussion leader

G. Coulon, "Surface characterization of thin diblock copolymer films by AFM."

H. Brown, "Chain pull-out and scission in adhesion and failure in polymers."

M. Fixman, discussion leader

K. Binder, "Monte Carlo simulation of the glass transition of polymer melts."

G. S. Grest, "Molecular dynamics simulations of tethered chains."

M. Olvera de la Cruz, "Transition to periodic structures in block copolymer melts."

E. A. Di Marzio, discussion leader

R. J. Roe, "Molecular dynamics simulations of glass transition and local motions in polymeric liquids and glasses."

E. W. Fischer, "Static and dynamic light scattering studies of glass forming liquids."

B. Chu, discussion leader

E. J. Amis, "Polymer associations: Solutions to gels."

P. Cotts, "Polysilanes: Structure and properties."

T. Norisuye, "Second and third virial coefficients of flexible polymers."

E. Petrie, discussion leader

Sir G. Allen, "Polymeric materials: The state of the art and future directions."

J. M. Pochan, discussion leader

T. Hashimoto, "Self-assembly of polymer blends via spinodal decomposition."

C. C. Han, "Polymer phase behaviors: Effects of shear rate and molar mass."

Organic Superconductors

Il Ciocco, Italy

J. P. Pouget, co-chair; F. Wudl, co-chair

9-14 May

J. P. Pouget, discussion leader

A. Hebard, "Fullerene superconductors."

C. Lieber, "Tunneling studies of fullerene superconductors."

TBA

G. Grüner, discussion leader

T. Uemura, "Muon spin resonance."

P. Cassoux, "Non- π superconductors."

J. Williams, discussion leader

D. Schweitzer, "Organic metals and superconductors of BOTT."

G. Saito, "Organic superconductors of BEDT-TTF and C₆₀."

S. Hünig, "New results of highly conducting DCNQI salts."

K. Bechgaard, discussion leader

M. Formigé, "Design of synthesis of new donors."

M. Bryce, "New materials."

T. Ishiguro, discussion leader

P. Stephens, "Structural aspects of fullerite materials."

K. Tanaka, "Novel fullerene materials."

P. Bernier, "Magnetic resonance studies."

F. Wudl, discussion leader

A. Zettle, "Single crystal fullerite materials."

Y. Achiba, A. Hirsch, "Chemistry of fullerenes."

M. Ribault, discussion leader

M. Tokumoto, "Organic superconductors with high T_c."

J. Woznitza, "Fermi surface studies of Et₂x."

J. Fink, "Electronic structure studies on fullerenes."

C. Pecile, discussion leader

P. Coppens, "Structure of organic metals and superconductors."

S. Ravy, "Structural studies of disorder in organic superconductors."

I. Schegolev, discussion leader

J. Mehring, "High resolution proton and ¹³C NMR of organic metals."

P. Chaikin, "Field induced phenomena."

D. Jerome, "Charge/spin density waves."

Quantitative Genetics and Biotechnology

Doubletree Hotel

F. Enfield, chair; B. Weir, vice chair

15-19 February

F. Enfield, discussion leader

J. Dudley, "Quantitative genetics and biotechnology—plant genetics."

W. G. Hill, "Quantitative genetics and biotechnology—animal genetics."

R. Lande, "Quantitative genetics and biotechnology—evolutionary genetics."

W. Bridges, discussion leader

N. Page, "Computer simulation evaluations of RFLP's in breeding programs."

W. Beavis, "Computer simulation evaluations of RFLP's in breeding programs."

M. Dentine, discussion leader

M. Georges, "Probing the bovine genome using molecular tools."

C. Haley, "QTL analysis in farm animals—how far can we go?"

J. Curtsinger, discussion leader

M. Wade, "Experimental evidence on the shifting balance theory of evolution."

S. Rich, discussion leader

A. Templeton, "A genealogical approach to quantitative genetic analysis."

M. Boehnke, "Human gene mapping."

M. Nielsen, discussion leader

J. Murray, "Transgenics and research into animal growth."

B. McCutchan, discussion leader

J. Romero-Severson, "The impact of marker—assisted selection on breeding paradigms."

T. Osborn, "Mapping quantitative trait loci in *Brassica*."

R. Sederoff, "Genomic mapping in loblolly pine."

B. Weir, discussion leader

T. Mitchel-Olds, "QTL mapping, chromosome walking, and candidate genes."

S. Knapp, "Mapping quantitative trait loci."

J. Thompson, Jr., discussion leader

R. Shaw, "Genetics of environmental responses in a wild plant community."

K. Lamkey, "Molecular marker analysis of recurrent selection in maize."

Scanning Tunneling Microscopy

Doubletree Hotel

R. S. Becker, chair; J. A. Kubby, vice chair

15-19 March

Epitaxial systems: J. Demuth, discussion leader

D. J. Biegelson, "STM studies of epitaxial GaAs and related materials."

Y. W. Mo, "Growth processes in silicon epitaxy."

P. Bedrossian, "Inverse epitaxy and surface structures on silicon."

Epitaxial systems: R. Wolkow, discussion leader

M. Pashley, "Surface features on epitaxial non-elemental semiconductors."

J. Nogami, "Adsorbates on semiconductor surfaces."

Atomic level surface chemistry: R. J. Hamers, discussion leader

R. Wolkow, "Silicon surface chemistry from 100 K to 350 K."

J. Boland, "Chemistry of elemental gases on silicon surfaces."

Ph. Avouris, "Surface chemistry with the STM."

Metallic systems: Y. Kuk, discussion leader

J. Behm, "Metallic systems."

J. Strosio, "Magnetic systems: Fe and Cr on Fe whiskers."

Dynamical processes at surfaces: Y. W. Mo, discussion leader

H. Tokumoto, "Phase transitions on Si(111) at elevated temperatures."

I. Stensgaard, "Dynamics of surface processes on metals."

H. Neddermeyer, "Dynamical processes in the oxidation of silicon surfaces."

Novel systems and techniques: R. M. Feenstra, discussion leader

Y. Kuk, "Geometric and electronic effects of clusters on surfaces."

R. J. Hamers, "New measurement techniques on semiconductors."

New applications at surfaces and interfaces: R. S. Becker, discussion leader

R. M. Feenstra, "Cross-sectional STM on heterostructure materials."

J. A. Kubby, "Surface/interface topography measured with STM."

R. Ludeke, "BEEM measurements using the STM."

Surface structure interactions and energetics: J. A. Kubby, discussion leader

B. S. Swartzentruber, "Step configuration and interactions on Si(001)."

O. Alerhand, "Theoretical aspects of epitaxy and surface structures."

Structures, Energetics, and Reaction Dynamics of Gaseous Ions

Doubletree Hotel

J. L. Beauchamp, chair; M. T. Bowlers, vice chair

1-5 March

Chemistry of molecular ionic clusters: M. Duncan, discussion leader

A. W. Castleman, Jr., "Shedding light on magic numbers and reaction dynamics of cluster ions."

B. Brutschy, "Ion chemistry in molecular clusters studied with laser spectroscopy."

M. S. El-Shall, "Reactions and thermochemistry of molecular cluster ions."

Reaction mechanisms of organic ions: S. R. Kass, discussion leader

N. Nibbering, "Reactions and structures of organic ions in the gas phase."

H. I. Kentamaa, "Bimolecular reaction mechanisms of distonic radical cations."

Reaction dynamics of biomolecules: C. Lebrilla, discussion leader

D. H. Russell, "The role of proton transfer reactions in desorption ionization of polar molecules."

S. A. McLuckey, "Unimolecular and bimolecular reactions of multiply charged biopolymers in a quadrupole ion trap."

J. Grotemeyer, "Dynamics in the ionization and fragmentation of larger biomolecules."

Chemistry of metal clusters: P. B. Armentrout, discussion leader

M. P. Irion, "Reactivity patterns of differ-

ent metal cluster ions stored in an FT-ICR mass spectrometer."

P. Norlander, "Correlation between electronic structure and reactivity of clusters."

Theoretical studies: W. L. Hase, discussion leader

L. Radom, "Theoretical studies of ion molecule reactions and interactions."

M. S. Gordon, "Ion-molecule potential energy surfaces."

E. Herbst, "Theoretical studies of hydrocarbon ion-hydrogen reactions of interstellar importance."

Ion spectroscopy: M. Okumura, discussion leader

J. M. Lisy, "Vibrational spectroscopy of solvated ions."

J. P. Maier, "Spectroscopic characterization of ions and ionic clusters."

Organometallic reaction mechanisms: P. van Koppen, discussion leader

H. Schwarz, "Mechanistic studies on C-H and C-C bond activation."

T. B. McMahon, "Binding and reaction of small molecules at transition metal centers in the gas phase: Studies at high and low pressures."

B. S. Freiser, "Organometallic photochemistry."

T. B. McMahon, discussion leader

P. Kebarle, "A brief history of ion chemistry."

Photodetachment processes: W. C. Lineberger, discussion leader

D. G. Leopold, "Photoelectron spectroscopy of organometallic anions."

D. M. Neumark, "Studies of transient species with negative ion photodetachment."

M. A. Johnson, "Photoinitiated reactions in cluster 'micro solvents.'"

Superconductivity

Casa Sirena Resort

D. C. Johnston, chair; O. Fischer and R. L. Greene, vice chairs

4-8 January

Materials and properties: M. B. Maple, discussion leader

R. J. Cava, "Phase diagrams in single layer cuprates and some new copper oxides."

T. Kawai, "Possible high-temperature superconductivity at 170 K in atomically layered $\text{Ca}_{1-x}\text{Sr}_x\text{CuO}_2$ thin films."

J. Goodenough, "Character of the Cu-O bond and high T_c superconductivity."

N-P. Ong, "Normal state transport properties of the cuprate superconductors."

Models and mechanisms: R. A. Klemm, discussion leader

P. W. Anderson, "Some surprising properties of the Gap equation in high T_c ."

D. J. Scalapino, "The effective electron-electron interaction in the 2 D Hubbard model."

Neutron scattering, spin fluctuations: R. E. Walstedt, discussion leader

B. Keimer, "Temperature scaling of the dynamical susceptibility in copper oxides."

J. Ruvalds, "Scaling of the spin susceptibility in high-temperature superconductors."

J. M. Tranquada, "Spin fluctuations in $\text{YBa}_2\text{Cu}_3\text{O}_x$."

K. Levin, "Comparing the spin dynamics in LaSrCuO and YBaCuO : Above and below T_c ."

Superconducting state measurements: L. H. Greene, discussion leader

T. Hasegawa, "Atomic site tunneling spectroscopy on high T_c superconductors."

M. R. Beasley, "RF measurements of high-temperature superconductors."

Electronic structure, correlations, properties: C. G. Olson, discussion leader

R. Liu, "Electronic structure studies of $\text{YBa}_2\text{Cu}_3\text{O}_x$ and $\text{YBa}_2\text{Cu}_4\text{O}_8$."

J. Allen, "Luttinger Fermi surface of metallic Gap states in $\text{Nd}_{1.85}\text{Ce}_{0.15}\text{CuO}_4$."

D. Pines, P. Monthoux, " $\text{YBa}_2\text{Cu}_3\text{O}_7$: A nearly antiferromagnetic Fermi liquid."

Optical properties: D. B. Tanner, discussion leader

D. B. Romero, "An infrared view of carrier dynamics in the cuprates."

T. R. Lemberger, "Infrared reflectance of doped $\text{YBa}_2(\text{Cu}_{1-x}\text{M}_x)_3\text{O}_7$: Where is the Gap?"

D. H. Drew, "Magneto-optics of high T_c superconductors."

Vortex properties: M. Tinkham, discussion leader

E. H. Brandt, "The flux line lattice in high T_c superconductors."

C. J. Lobb, "Vortex motion and the Hall effect in the superconducting state."

Y. Iye, "Flux dynamics and dissipation in layered superconductors in parallel and nearly parallel field configurations."

T. K. Worthington, "The observation of separate vortex melting and vortex glass transitions in defect-enhanced YBaCuO single crystals."

Doped fullerenes: M. J. Rice, discussion leader

A. P. Ramirez, "Experimental aspects of superconductivity in alkali-doped fullerenes."

S. Chakravarty, "Electronic correlation effects and superconductivity in doped fullerenes."

Doped-hole segregation: G. Kotliar, discussion leader

V. J. Emery, "Frustrated phase separation and high-temperature superconductivity."

P. C. Hammel, "Phase separation, structure and superconductivity in super-oxygenated $\text{La}_2\text{CuO}_{4+\delta}$."

J. H. Cho, "Microscopic versus macroscopic doped-hole segregation in $\text{La}_{2-x}\text{Sr}_x\text{CuO}_{4+\delta}$."

Invited and contributed posters are an integral and important part of the conference.

Temperature Stress in Plants

Casa Sirena Resort

P. L. Steponkus, chair; M. Thomashow, vice chair

1-5 February

L. H. Allen, Jr., discussion leader

L. O. Mearns, "The greenhouse effect and global warming."

C. Rosenzweig, "Agricultural impacts of global climate changes."

K. J. Boote, "Modeling linkages of tem-

perature and CO_2 at the physiological level."

C. J. Nelson, discussion leader

G. M. Paulsen, "High-temperature stress and photosynthetic and reproductive processes."

A. E. Hall, "Physiology and genetics of heat tolerance during reproductive development."

L. Nover, discussion leader

E. Vierling, "Small heat shock proteins: Components of three cellular compartments."

D. B. Walden, "The expression of heat shock genes during meiosis and development of the male gametophyte."

D. B. McKay, "Structural and mechanistic studies of a 70-kilodalton heat shock-related protein."

B. Martin, discussion leader

R. S. Criddle, "Calorimetric studies of temperature coefficient of respiration and plant distributions."

C. Pollock, "Effect of low temperature on growth and source-sink relationships."

R. W. Breidenbach, discussion leader

J. Greaves, "Breeding and biotechnology to improved growth and development of maize at suboptimal temperatures."

N. R. Baker, "Chilling effects on chloroplast development in maize and the consequences for crop photosynthetic productivity."

N. Murata, "Transgenic plants and improved photosynthesis/chilling tolerance."

S. Yoshida, discussion leader

A. Rikkin, "Chilling responses and circadian rhythms."

D. R. Ort, "Circadian rhythms and regulation of transcription."

J. Singh, discussion leader

M. Uemura, M. S. Webb, "Genotypic diversity in the lipid composition and cryostability of the plasma membrane."

M. M. Millard, "NMR and MRI studies of water binding in wheat during cold acclimation."

E. N. Ashworth, "Ice formation in deciduous trees: Cell wall and membrane responses."

M. Griffith, discussion leader

J. G. Duman, "Thermal hysteresis (antifreeze?) proteins."

D. K. Hincha, "Cryoprotective proteins: Low temperature induction and modes of action."

M. Thomashow, discussion leader

M. Borg (Franck), "Low temperature-induced peptides of *Arabidopsis thaliana*."

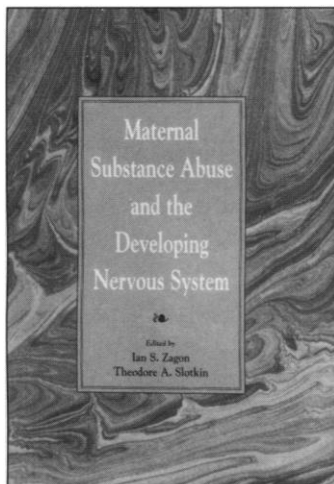
R. S. Dhindsa, "Low-temperature signal transduction."

P. M. Hayes, "Mapping of quantitative traits associated with winter hardiness in barley."

Poster sessions will be scheduled in the afternoon (4:30 to 6:00 p.m.) of Monday (High-Temperature Stress), Tuesday (Chilling Stress), and Wednesday (Freezing Stress). Conferees who wish to present should send their abstract to: Dr. Michael Thomashow, Department of Crop and Soil Science, Michigan State University, East Lansing, Michigan, 48824-1325. Telephone: 517-355-2299, FAX: 517-353-5174. Deadline for receipt of abstracts is 15 December 1992.

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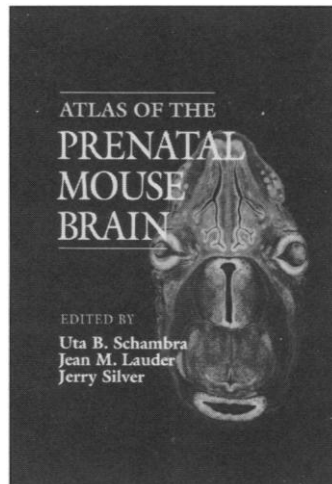
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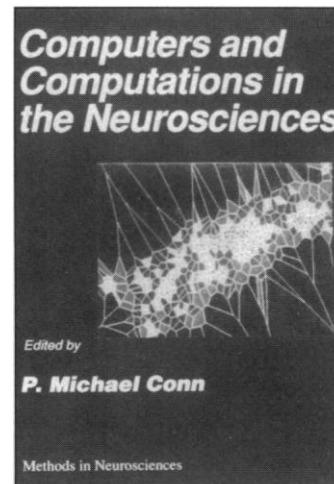
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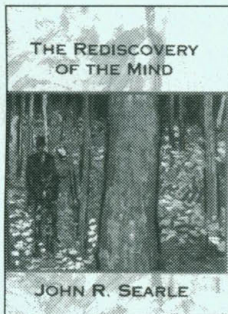
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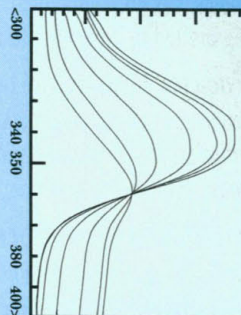
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