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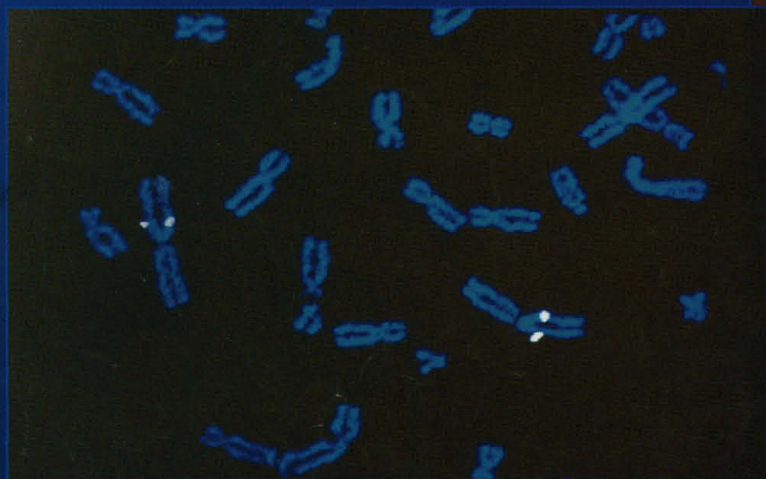
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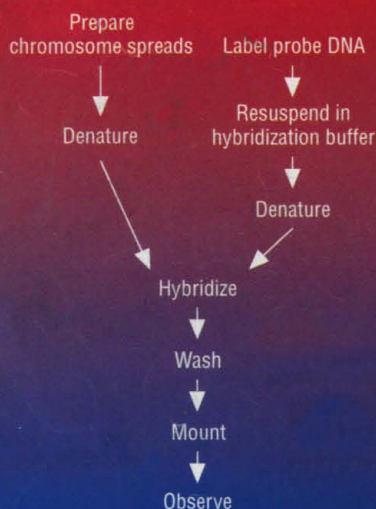
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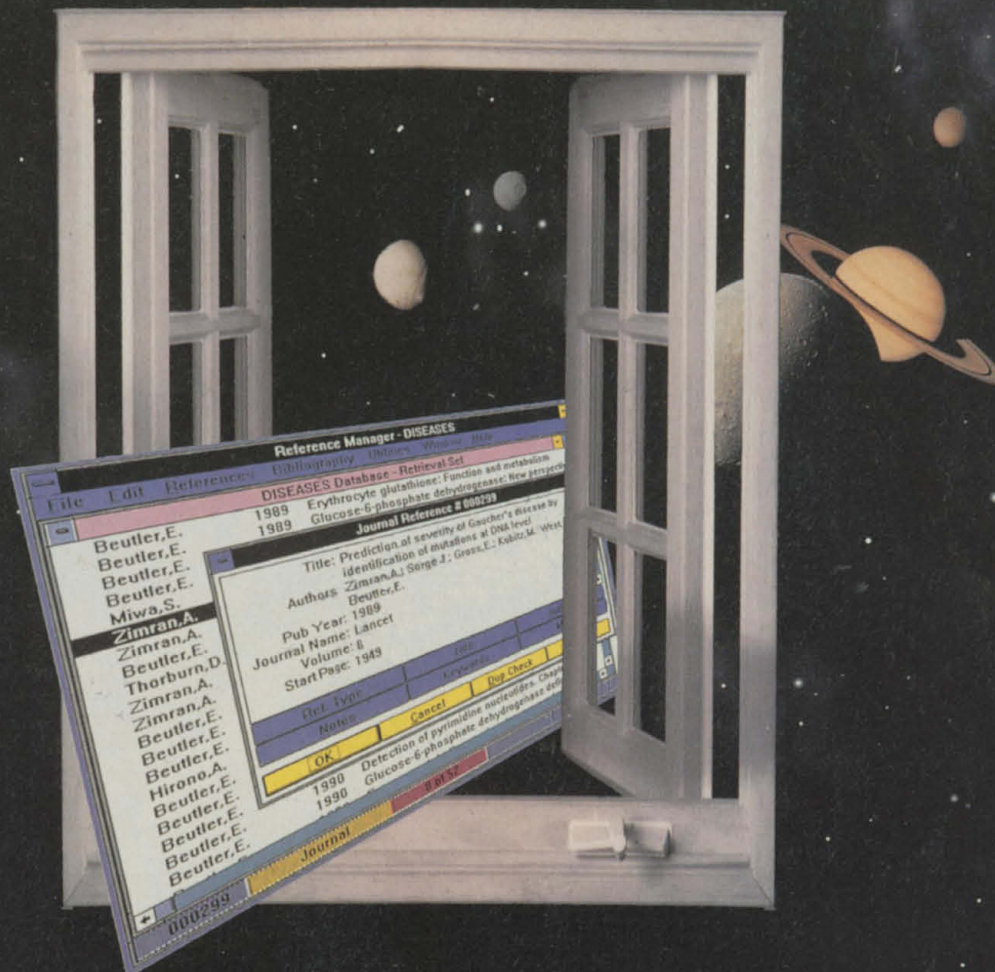
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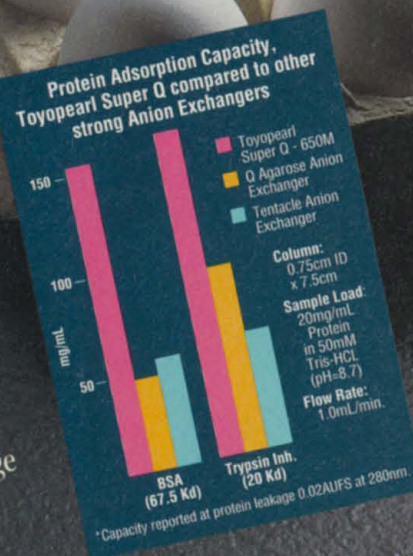
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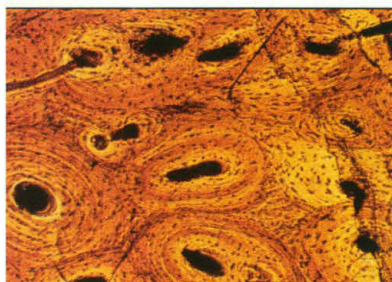
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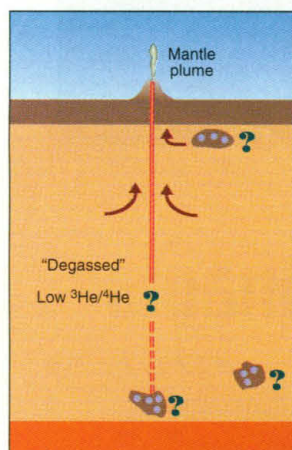
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Mouse embryo at 11.5 days of development. This embryo harbors a β -galactosidase transgene linked to the promoter of the *myogenin* gene, active in skeletal muscle formation. The expression pattern of the transgene (in blue) reflects that of the endogenous *myogenin*

locus and is restricted to the myotomal region of the somites and the limb buds. Mutations in the *myogenin* promoter suggest that separable regulatory elements govern *myogenin* expression in somites and limb buds. See page 215. [Photograph: Tse-Chang Cheng]



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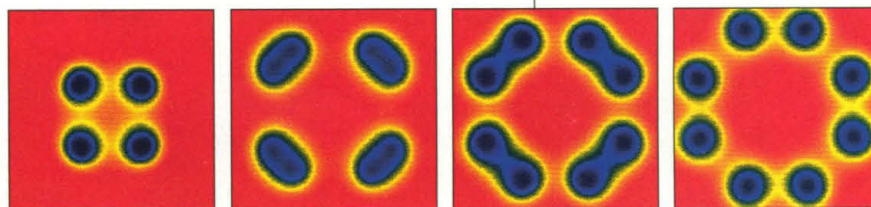
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A new pattern emerges



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By moonlight

A thin exhalation of gases from the lunar surface is all the moon can boast of an atmosphere, but spectroscopic observations by Flynn and Mendillo (p. 184) show that it extends to surprisingly large distances. Sodium atoms efficiently scatter sunlight at the D wavelengths and had previously been detected within 100 kilometers of the moon's surface. The authors used a technique in which the disk of the moon is blocked out and found sodium as far out as five lunar radii. The density of sodium varies in a characteristic way with solar zenith angle, suggesting that solar radiation drives it and other gases from the lunar regolith.

□

Patterns from chemical fronts

Stationary chemical patterns have been observed that form in response to large perturbations of the system (see news story by Amato, p. 165). Lee *et al.* (p. 192) studied the iodate-ferrocyanide-sulfite reaction, which has stable regimes of high and low pH, in a continuously fed thin gel reactor. The system can be perturbed with ultraviolet light; reacting fronts grow toward one another and then stop, producing an irregular pattern. This type of pattern formation is unlike Turing patterns or chemical waves; Pearson (p. 189) presents a numerical simulation showing that a simple reaction-diffusion model can account for such patterns.

□

Ice cores and global circulation

New high-resolution records from Greenland ice cores are revealing many details of climate

Preceding the main seismic event

Slow precursors represent low-frequency seismic radiation, perhaps reflecting initial, gradual deformation that leads to an abrupt earthquake rupture. Their detection and analysis may thus provide a means for short-term earthquake prediction. Ihmlé *et al.* (p. 177) present an analysis of the precursor to the 1989 Macquarie Ridge earthquake, south of New Zealand. The analysis suggests that the slow precursor began 100 seconds before the main, magnitude 8.2 event and that the moment release of the precursor alone was equivalent to a magnitude 7.6 event.

changes accompanying the last deglaciation and throughout the Holocene. The results have shown that deglaciation was interrupted and the climate became much colder abruptly about 13,000 years ago, an event known as the Younger Dryas. Mayewski *et al.* (p. 195) use analysis of the chemical species in the ice core to infer changes in atmospheric circulation—particularly the size of the polar atmospheric cell—affecting flow over Greenland during this episode. The results suggest that crustal and sea salt loading increased within about 10 years at the start of the Younger Dryas and dropped rapidly at its termination.

□

Coming together

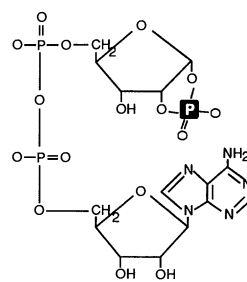
How transcription factors act to regulate transcription from binding sites located hundreds of nucleotides away from the transcription start site is unknown. Cullen *et al.* (p. 203) have studied regulation at a distance in the rat *prolactin* gene by using a nuclear ligation assay. The estrogen receptor binds to a distal regulatory region of the *prolactin* gene that is located 1550 base pairs upstream of the transcription start site. They find that the distal enhancer and the proximal promoter regions are juxtaposed

in native chromatin and that this proximity is stabilized by estrogen.

□

Splicing metabolite

An unusual metabolite forms from nicotinamide adenine dinucleotide during the splicing of transfer RNA molecules in yeast. Culver *et al.* (p. 206) show that adenosine diphosphate-ribose 1"-2" cyclic phosphate is produced when the 2' phosphate in the spliced transfer RNA is removed by a phosphotransferase enzyme.



Formation of this product could also be observed in *Xenopus* oocytes. Because some splicing pathways bypass 2' phosphate formation, this metabolite may have another cellular function.

□

Targeting anticancer drugs

Immunoconjugate drugs, in which monoclonal antibodies are used to target toxic drugs to

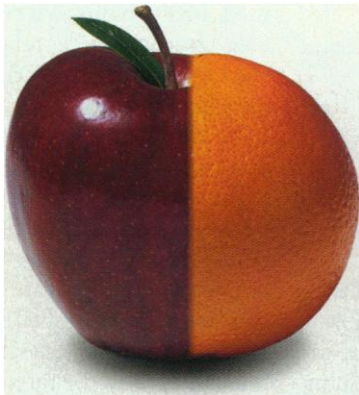
carcinoma cells, often have better activity than unconjugated drugs but may require unacceptably high doses. Trail *et al.* (p. 212) describe an immunoconjugate of doxorubicin that is effective against human tumor xenografts in rodents, in some cases at 1/20 of the maximum tolerated dose. The antibody used, BR96, binds to a cell-surface antigen that is related to the Lewis Y antigen and that is enriched on tumor cells. BR96 is rapidly internalized into endosomes and lysosomes, where the acidic environment facilitates cleavage of the hydrazone bond linking the drug to the antibody. The conjugate caused regressions of established human lung cancer in rats, which like humans express the target antigen on normal cells.

□

Direct inhibition of adenylyl cyclase

Hormone receptors are coupled to activation or inhibition of adenylyl cyclase (the enzyme that generates the intracellular "second messenger" cyclic adenosine monophosphate) by heterotrimeric guanine nucleotide-binding proteins (G proteins). Although activation of adenylyl cyclase is known to result from interaction with the active guanosine triphosphate-bound form of the G protein α subunit G_{α} , the mechanism by which adenylyl cyclase is inhibited has been more difficult to demonstrate. Taussig *et al.* (p. 218) now show that activated G_{α} does directly inhibit certain isoforms of adenylyl cyclase. The effect required highly purified, myristoylated G_{α} and was evident only at relatively high concentrations of G_{α} . The authors present a model that suggests that these concentrations of α subunits may be physiologically relevant.

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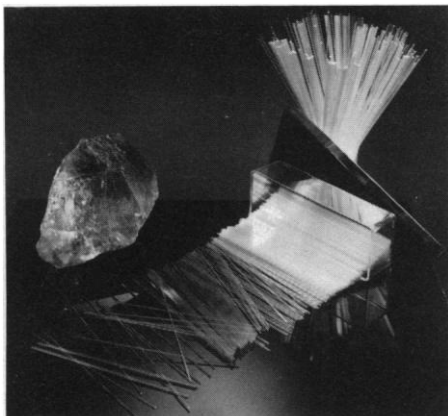
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References: Takeichi, M.; *Science* 251:1451-1455 (1991).
Takeichi, M.; *Development* 102:639-655 (1988).

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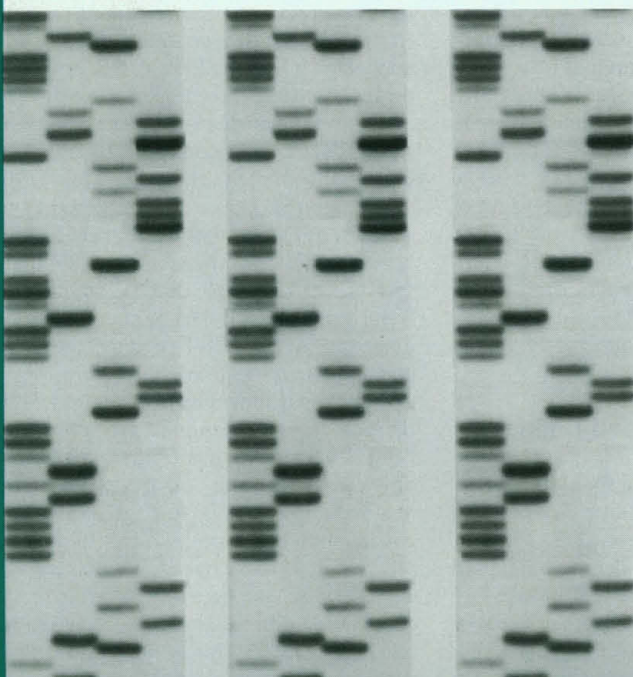
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Sears, et. al. (1992)
Biotechniques 13, 626-633.

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Noon-8:00pm
REGISTRATION

Noon-6:00pm
**EMPLOYMENT
EXCHANGE**

5:00-7:00pm
**EXHIBITION OPENING
AND RECEPTION**

7:00-7:15pm
INTRODUCTION
Savio L.C. Woo

7:15-8:15pm
**THOMAS ALVA
EDISON LECTURE**
Kary Mullis

8:15-9:15pm
KEYNOTE ADDRESS
George Brown, Jr.
U.S. Congress

For a complete
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SATURDAY, 7 AUGUST

7:00am-9:00pm
REGISTRATION

7:30am-6:00pm
**EMPLOYMENT
EXCHANGE**

8:00-11:00am
PLENARY LECTURES
Francis S. Collins
Eric Lander
Kenneth W. Culver
Ivar Giaever

8:30am-12:45pm
**CAREER
DEVELOPMENT
SEMINARS**

10:00am-3:00pm
EXHIBITS

11:00-11:20am
COFFEE BREAK

11:20am-12:30pm
**EMERGING
TECHNOLOGIES**
Alan Garfinkel
Flossie Wong-Staal

12:30-2:30pm
LUNCH

1:00-2:15pm
**CONCURRENT
EXHIBITOR
WORKSHOPS**

PREPARATIVE ELECTROPHORESIS
TECHNIQUES
Hoefler Scientific Instruments

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DNA SEQUENCING
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CENTRIFUGAL PROTEIN
CONCENTRATION WITH
CENTRICELL
Polysciences, Inc.

2:30-5:00pm
**CONCURRENT
DISCUSSIONS**

(Additional speakers to be selected
from poster presenters.)

DNA AMPLIFICATION
Julian Gordon
Francois Ferre
Joseph DiCesare

**OLIGONUCLEOTIDE SYNTHESIS,
ANTISENSE & ANTIGENE
PHARMACEUTICALS**
Paul Zamecnik
Mark Matteucci

SENSORS
Raoul Kopelman
David R. Walt
Mark E. Meyerhoff

**TUMOR IMMUNOGENICITY
& MARKERS**
Jim Allison
Gary J. Nabel

NEW MICROSCOPY
Robert D. Black

**CARBOHYDRATE STRUCTURE
ANALYSIS & GLYCOBIOLOGY**
John C. Klock

GENE TRANSFER
Alan Colman
Oliver Smithies
George Stamatoyannopoulos

5:00-7:00pm
**POSTER SESSION/
EXHIBITS**

5:00-6:00pm
**CAREER
DEVELOPMENT
SEMINARS**

8:00-10:30pm
**EVENING
CONCURRENT
PLENARY LECTURES**

PATENT LAW
Lynn H. Pasahow
Kevin Kaster

SOLID PHASE SYNTHESIS
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Joseph C. Glorioso
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SUNDAY, 8 AUGUST

7:00am-9:00pm

REGISTRATION

7:30am-6:00pm

EMPLOYMENT EXCHANGE

8:00-10:00am

PLENARY LECTURES

George M. Whitesides
Robert Langer
May R. Berenbaum

8:30am-12:45pm

CAREER DEVELOPMENT SEMINARS

10:00-10:30am

COFFEE BREAK

10:00am-3:00pm

EXHIBITS

10:30am-12:30pm

PLENARY LECTURES

Donald Hilvert
Steven M. Block

12:30-2:30pm

LUNCH

1:00-2:15pm

CONCURRENT EXHIBITOR WORKSHOPS

NOVEL TECHNIQUES FOR
WESTERN BLOTTING &
NUCLEIC ACID DETECTION/
QUANTIFICATION
Amersham Corp

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STAINING TECHNIQUES
Dako Corp

RAPID DNA SEQUENCING WITH
THE GENESPRINTER SYSTEM
Fotodyne

FLUORESCENCE IMAGE
ANALYSIS
Molecular Dynamics

2:30-5:00pm

CONCURRENT DISCUSSIONS

(Additional speakers to be selected
from poster presenters.)

NONINVASIVE DIAGNOSTICS

Christopher Green
Steven Kornuth
Robert Turner
James Hyde

DRUG TARGETING & LIPOSOMES

Phillip L. Felgner
W. Mark Saltzman
Kam Leong

CINICAL IMMUNOLOGY/ IMMUNOSUPPRESSION/ VACCINES

Gene M. Shearer
Margaret A. Liu
Mario Clerici

BLOOD SUBSTITUTES

David Anderson
Thomas H. Schmitz
Antony Mathews

FLUORESCENT IN SITU HYBRIDIZATION & NONISOTOPIC DETECTION

Irena Bronstein

NMR DETERMINATION OF PROTEIN STRUCTURE

Stephen Mayo

ANTIBODY CATALYSIS

Donald Landry
Louis J. Liotta

5:00-7:00pm

POSTER SESSION/ EXHIBITS

5:00-6:00pm

CAREER DEVELOPMENT SEMINARS

8:00-10:30pm

EVENING CONCURRENT PLENARY LECTURES

ENGINEERING PROTEINS

David A. Tirrell
Charles S. Craik
Cori Gorman
David Y. Jackson

MONDAY, 9 AUGUST

7:00am-9:00pm

REGISTRATION

7:30am-6:00pm

EMPLOYMENT EXCHANGE

8:00-10:00am

PLENARY LECTURES

Robert B. Goldberg
William E. Timberlake
Robert Fraley

8:30am-12:45pm

CAREER DEVELOPMENT SEMINARS

10:00-10:30am

COFFEE BREAK

10:00am-3:00pm

EXHIBITS

10:30am-12:30pm

PLENARY LECTURES

Jack Belliveau
David Housman

12:30-2:30pm

LUNCH

1:00-2:15pm

CONCURRENT EXHIBITOR WORKSHOPS

PROPHET SYSTEM WORKSHOP
BBN Systems and Technologies

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Information Program

SPEEDING UP RESEARCH
WITH ELECTRONIC
AUTORADIOGRAPHY
Packard Instruments

INTRODUCTION TO
MATHEMATICA*
Wolfram Research, Inc.

2:30-5:00pm

CONCURRENT DISCUSSIONS

(Additional speakers to be selected
from poster presenters.)

SCREENING

Joe Gray
Michael H. Wigler

GENE SEQUENCING TOOLS: MASS SPECTROMETRY AND OTHER METHODS

R. Graham Cooks
Lloyd Smith
Charles Cantor
T. Williams Hutchens
Robert Hettich

PEPTIDES & COMBINATORIAL LIBRARIES

Ronald Hoess
William DeGrado
Richard A. Houghten
Jon Ellman

FUNCTIONAL MAGNETIC RESONANCE IMAGING

Paul A. Bottomley
Kamil Ugurbil
Charles Dumoulin
Robert R. Edelman
Thomas J. Brady

DNA DIAGNOSTICS

C. Thomas Caskey
Janet D. Rowley

DRUG DESIGN

Ray Salemme
Joan S. Brugge

GROWTH FACTORS, CYTOKINES & THEIR RECEPTORS

Joost J. Oppenheim
Michael Klagsbrun
Herb Lin
Andrew Geiser

ROBOTICS & NEURAL NETWORKS

Daniel S. Levine
Bruce Bullock
Paolo Gaudiano
Samuel Leven

AIDS RESEARCH & ANIMAL MODELS

Ronald C. Desrosiers

5:00-6:00pm

CAREER DEVELOPMENT SEMINARS

8:00-10:30pm

EVENING CONCURRENT PLENARY LECTURES

GENOMIC LIBRARIES

David C. Page
Nat Sternberg
Jean-Michel H. Vos
Melvin Simon and Hiroaki Shizuya
F. William Studier

RNA & IN VITRO GENETIC SELECTION

Jack Szostak
Julius Rebek

TUESDAY, 10 AUGUST

7:00am-3:00pm

REGISTRATION

8:00-10:00am

PLENARY LECTURES

David J. States
William R. Jacobs, Jr.
Bernardo Nadal-Ginard

9:00am-1:00pm

EMPLOYMENT EXCHANGE

10:00-10:30am

COFFEE BREAK

10:30am-12:30pm

EMERGING TECHNOLOGIES

Wah Chiu
Daniel A. Abramowicz

12:30-2:00pm

LUNCH

2:00-5:00pm

EMERGING TECHNOLOGIES

John E. Buster
Mark R. Hughes
Peter S. Linsley
Julian Rosenman
David S. Bredt

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| <input type="checkbox"/> Peptides and Combinatorial Libraries | <input type="checkbox"/> Clinical Immunology, Immunosuppression and Vaccines | <input type="checkbox"/> New Microscopy |
| <input type="checkbox"/> NMR Determination of Protein Structure | <input type="checkbox"/> Growth Factors/Cytokines/Receptors | <input type="checkbox"/> Sensors |
| <input type="checkbox"/> Antibody Catalysis | <input type="checkbox"/> Tumor Immunogenicity and Markers | <input type="checkbox"/> Robotics and Neural Networks |
| <input type="checkbox"/> Non-invasive Diagnostics | | <input type="checkbox"/> Carbohydrate Structure Analysis |
| <input type="checkbox"/> Imaging | | <input type="checkbox"/> Gene Transfer |

MEETING FEES

Registration fees¹ (Check one box only)

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<input type="checkbox"/> Regular AAAS member	\$295	\$395
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AS3KS

IMPORTANT FOOTNOTES

- [1] Deadline for advance registration is 28 July! Registrations received after this date will not be processed, however, you may register on site at the Hynes Convention Center beginning at noon on 6 August. One-day registration is available on site only at the following rates: Regular member-\$195, regular nonmember-\$245, student member-\$95, student nonmember-\$125.
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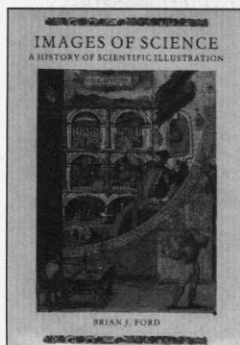
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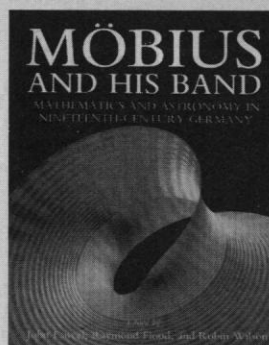
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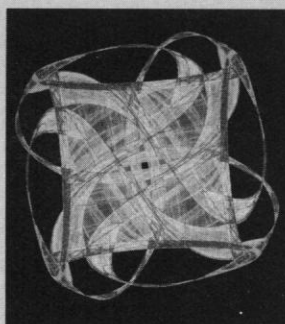
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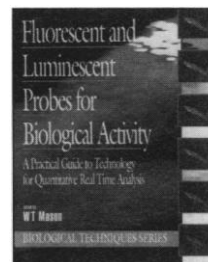
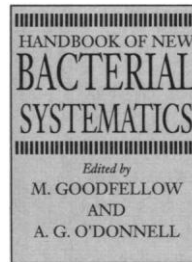
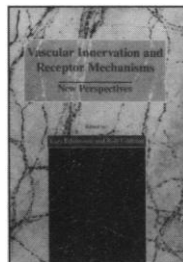
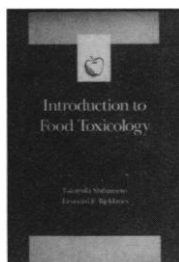
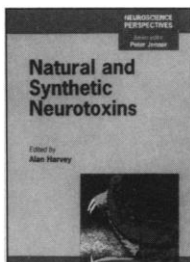
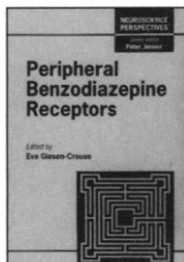
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