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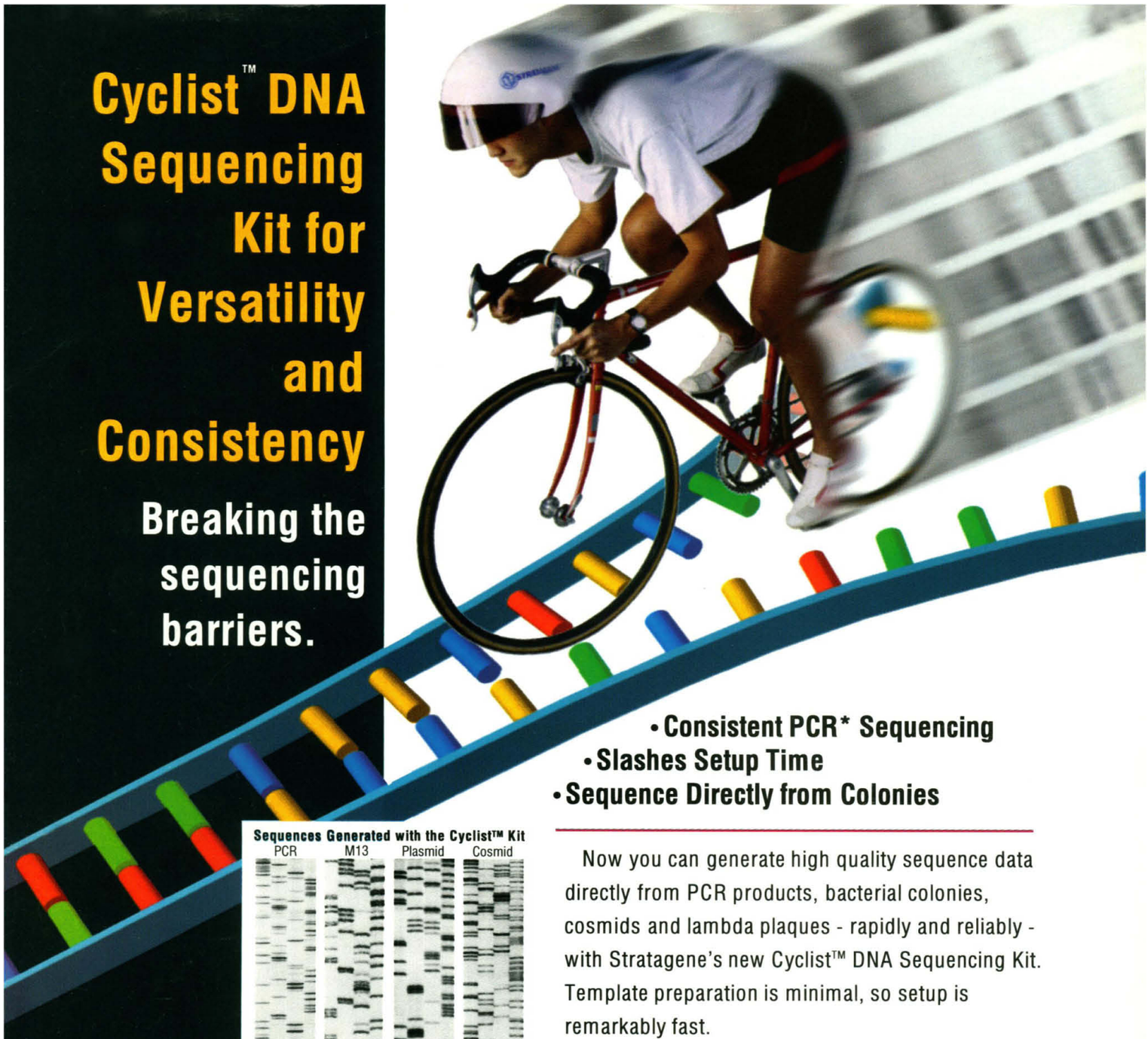
19 FEBRUARY 1993 $6.00
VOL. 259 • PAGES 1093–1224

Gordon Research Conferences

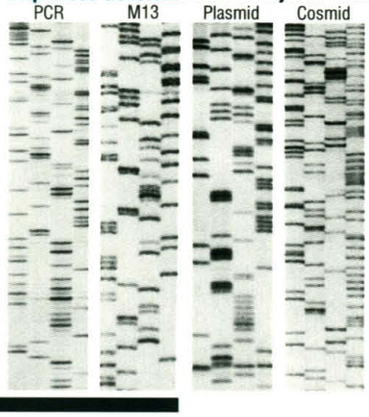
Cyclist™ DNA Sequencing Kit for Versatility and Consistency

Breaking the sequencing barriers.



- **Consistent PCR* Sequencing**
- **Slashes Setup Time**
- **Sequence Directly from Colonies**

Sequences Generated with the Cyclist™ Kit



The basic reaction consisted of reaction mix (buffer and nucleotides), template, primer, ^{33}P-dATP radiolabeled nucleotide and *Taq* DNA polymerase aliquoted to the four termination tubes containing dideoxynucleotides. An initial denaturation at 95°C for 5 minutes was followed by 30 cycles at 95°C for 30 seconds, 55°C for 30 seconds and 72°C for 60 seconds in Stratagene's SCS-2 Temperature Cycler.

Now you can generate high quality sequence data directly from PCR products, bacterial colonies, cosmids and lambda plaques - rapidly and reliably - with Stratagene's new Cyclist™ DNA Sequencing Kit. Template preparation is minimal, so setup is remarkably fast.

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* The polymerase chain reaction (PCR) process is covered by patents in the U.S. owned by Hoffman-La Roche Inc. Use of the PCR process requires a license.

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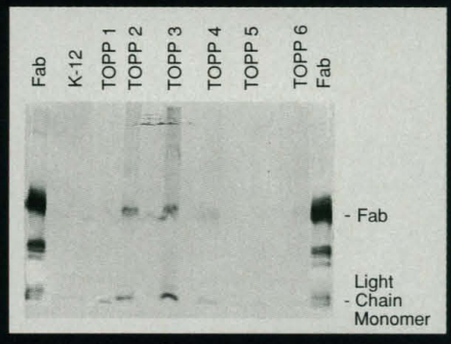

Figure:
Expression of Fab antibody protein in *E. coli* K-12 and TOPP™ Cells.

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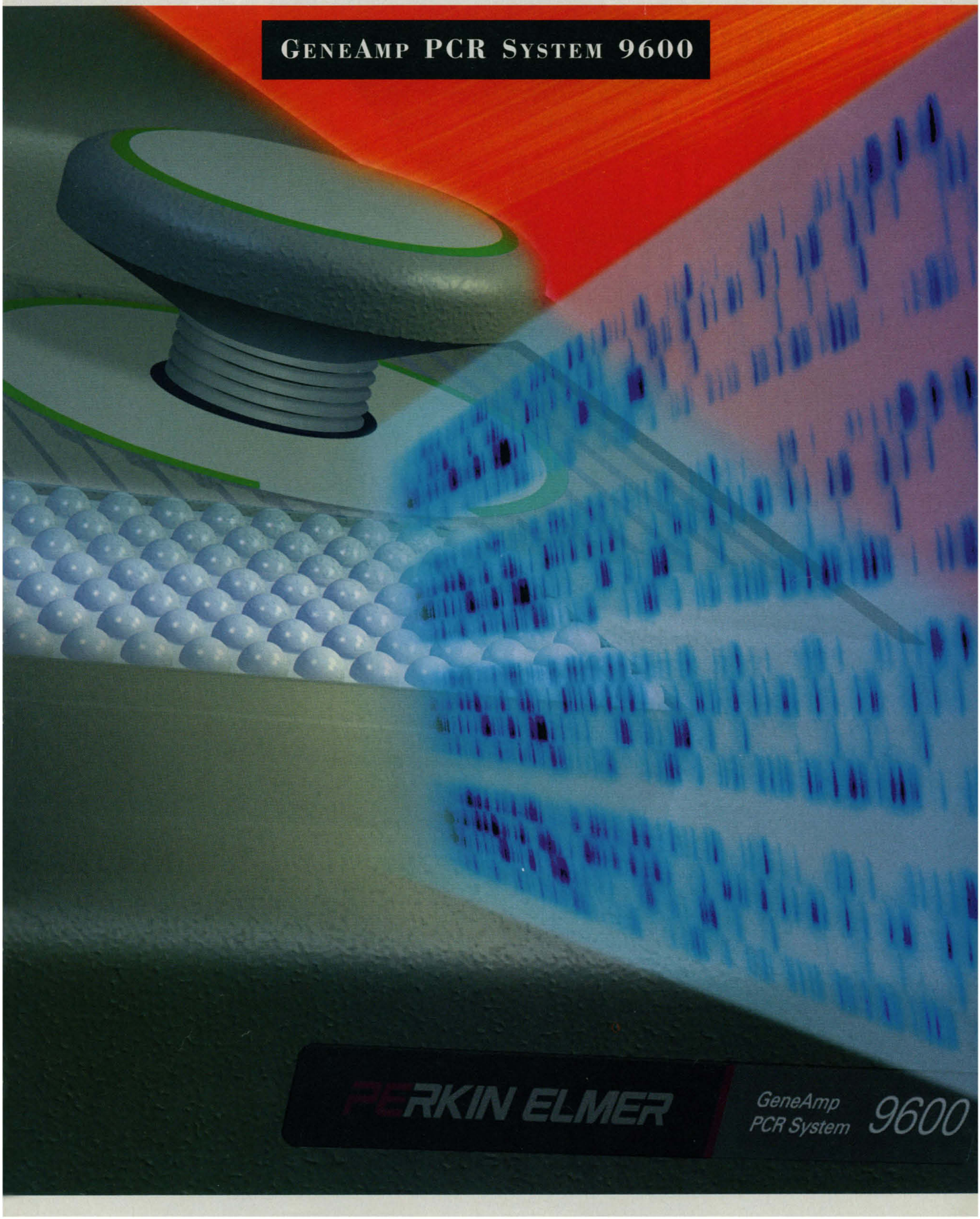

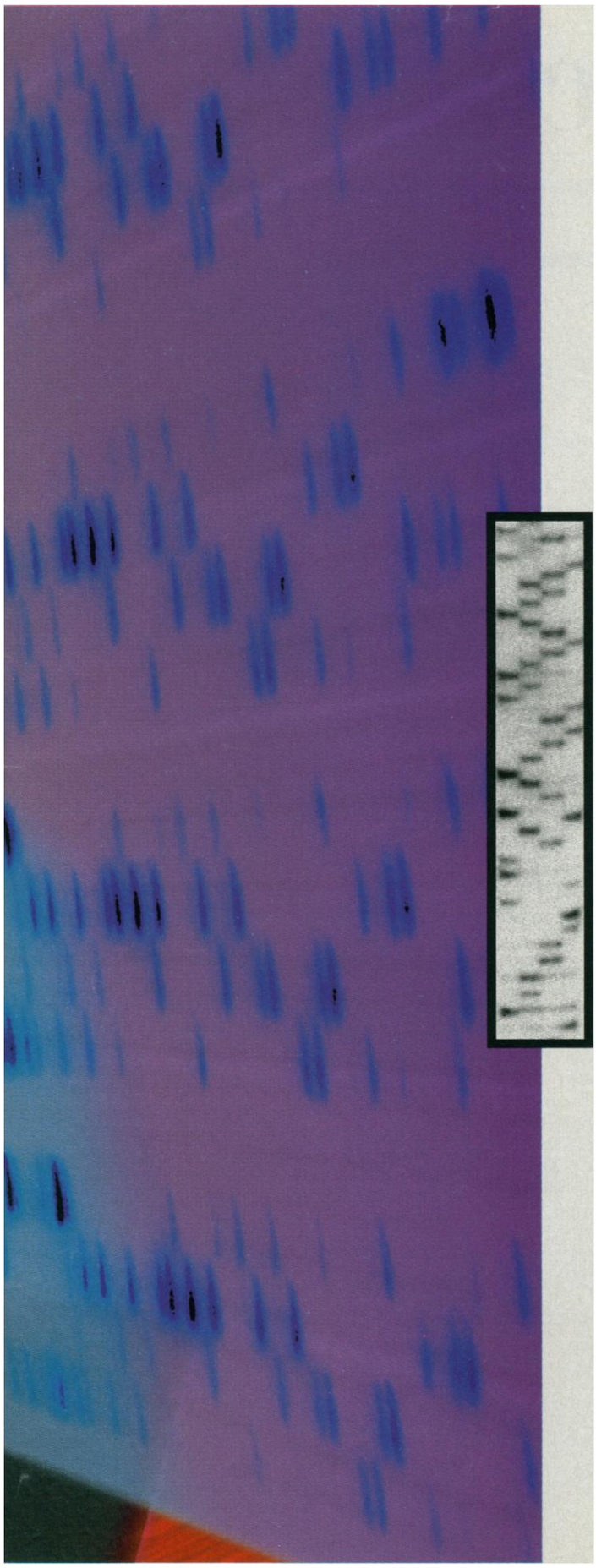

DNA SEQUENCING OF RETROVIRAL LTR USING PCR PRODUCTS AMPLIFIED FROM NIH 3T3 FIBROBLAST CELL LINE ON THE GENEAMP PCR SYSTEM 9600. COURTESY OF PIA MARIA CHALLITA, CHILDREN'S HOSPITAL, LOS ANGELES, CALIFORNIA.

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Perkin-Elmer PCR reagents are developed and manufactured by Roche Molecular Systems, Inc., Branchburg, New Jersey, U.S.A.

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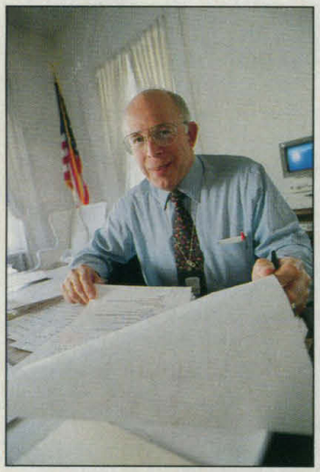

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The science adviser's first 2 weeks

NEWS & COMMENT

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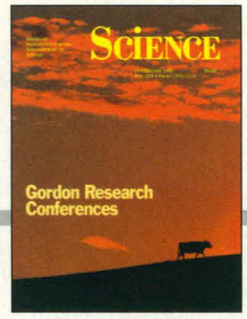
1130 Volcanic avalanches

DEPARTMENTS

COVER

Scientists and researchers from rich and varied fields will gather in informal settings for many of this year's Gordon Research Conferences to ruminate the fruits of their research. See page 1176 for details of the 1993 conferences. [Photograph: Pamela Zilly/Image Bank]



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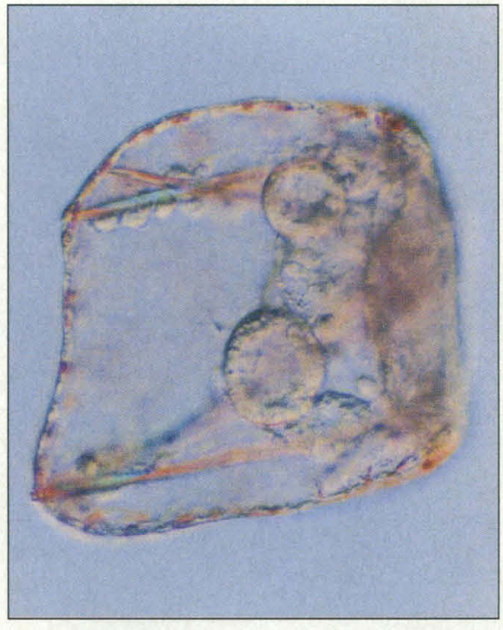

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Changing cell fate in sea urchin embryos

◩ **Indicates accompanying feature**

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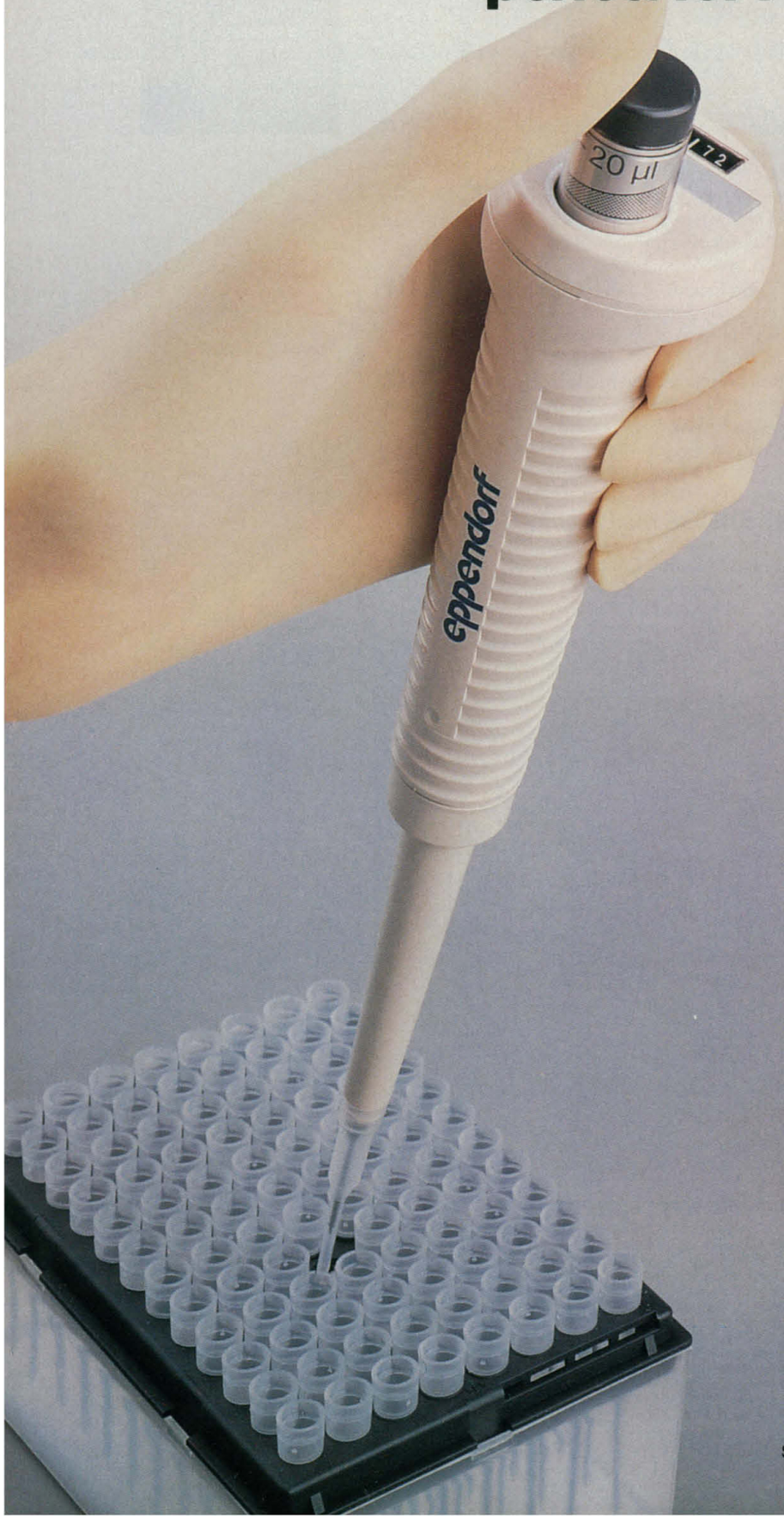

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edited by PHIL SZUROMI

Comet chemistry

Modeling studies of the chemical reactions of formaldehyde (H_2CO) in cometary ices suggests that ammonia (NH_3) may play a critical role in the formation of larger organic molecules. Schutte *et al.* (p. 1143) used infrared spectroscopy to characterize the reaction products that formed when mixtures of H_2CO, H_2O, CH_3OH, CO, and NH_3 were warmed from 40 to 80 kelvin. The distribution of products, which appear to be derivatives of polyoxymethylene, depends on the initial composition and may be useful tracers of a comet's history.

Random vibrations in solid fullerenes

Solid-phase compacts of C_{60} and C_{70} display unusual thermal properties at low temperatures. Olson *et al.* (p. 1145) measured the specific heat and thermal conductivity of fullerene mixtures that contained predominantly C_{60}. The thermal properties of crystalline solids are usually well described by the Debye model of collective excitations; absorbed heat excites phonon modes. These C_{60}/C_{70} compacts, however, generally follow an Einstein model in which the buckyballs vibrate with random phases. Such behavior has been seen previously, but the materials were amorphous solids.

Deep waters

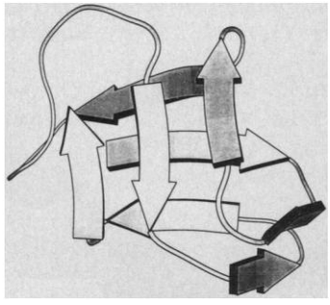
Ocean circulation, particularly the formation and upwelling of deep water, affects both atmospheric heat transport and CO_2 levels. The accompanying climate changes can be dramatic; during the last glaciation, deep waters in the North Atlantic were derived primarily from the southern ocean. Oppo and Lehman (p. 1148) used carbon isotope data from benthic foraminifera in cores in the shallow North Atlantic Ocean to show that this deep water did not ventilate, as had been suggested, but was overlain at intermediate depths by waters derived from the polar North Atlantic. This intermediate water cycled rapidly in the glacial North Atlantic Ocean and may have helped decrease atmospheric CO_2 levels.

Hot iron in the early solar system

Evidence for the original presence of several short-lived radionuclides in meteorites provides a chronometer for processes in the early solar system; these nuclides might also have been important heat sources in early-formed planetesimals. Shukolyukov and Lugmair (p. 1138) report evidence for the existence of iron-60 (half-life of about 1.5 million years) over large scales in the early solar system. The evidence is in the form of excesses of its ultimate daughter, nickel-60, relative to other nickel isotopes in the meteorite Chervony Kut. The inferred abundance of iron-60 in this meteorite suggests that iron-60 could have provided sufficient heat to melt rapidly formed planetesimals within a few million years.

Antifreeze sans helices

Some marine fishes that inhabit polar and subpolar waters contain antifreeze proteins (AFPs) in their blood; AFPs depress the



freezing point of water by binding to the surface of ice crystal nuclei, thereby inhibiting their growth. Type I AFP forms a long, amphipathic helix that could hydrogen bond to the ice crystal on the hydrophilic side and repel water adsorption on the hydrophobic side. Type III AFP is quite different; the nuclear magnetic resonance structure of Sönnichsen *et al.* (p. 1154) reveals an unusual β-sheet sandwich structure. The predominantly hydrophilic surfaces on Type III AFP suggest a more complex binding mechanism.

SH3 binding sites

Src homology 3 (SH3) domains are found in proteins that participate in signal transduction and in proteins of the cytoskeleton. Various proteins appear to interact through these SH3 domains. Ren *et al.* (p. 1157) identified the SH3 binding sites of two proteins that bind to the SH3 domain of the proto-oncogene product Abl. The SH3 binding motif was found to be similar to sequences in the murine *limb deformity* gene product and the m4 muscarinic acetylcholine receptor from rat.

Diabetes without T cell diversity

In the nonobese diabetic (NOD) mouse model of insulin-dependent diabetes, lymphocytes invade the pancreatic islets. Because T cell recognition of self antigens is thought to play a primary role in this process, Lipes *et al.* (p. 1165) created transgenic NOD mice in which endogenous T cells were suppressed and that predominantly expressed single T cell receptor β (TCRβ) or TCRαβ sequences unrelated to diabetes. Despite this skewing of the T cell repertoire, progression to diabetes was not slowed down. Rather than being antigen-driven, other pathways, such as macrophage activation and cytokine production, may drive recruitment of T cells.

Traffic cop

Guanosine triphosphate (GTP)–binding proteins are GTPases that have been implicated in many intracellular processes, such as vesicle trafficking and the regulation of ion channels. These proteins cycle between two conformations, depending on whether the bound nucleotide is GTP or already has been hydrolyzed to guanosine diphosphate. Squid nerve cells contain giant synapses that are directly accessible by microelectrodes, making it possible to study protein function at an intact synaptic terminal. Hess *et al.* (p. 1169) injected nonhydrolyzable guanine nucleotide analogs to show that GTP-binding proteins function in the fusion of synaptic vesicles with the plasma membrane at the site of neurotransmitter release as well as in the recycling of synaptic vesicles after release. Thus, GTP-binding proteins may ensure that synaptic vesicles dock only with appropriate sites on the plasma membrane of the nerve cell and that vesicular components are retrieved for further cycles of transmitter release.

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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 Gammapathies 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, S. Garattini and A. Luini (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. Pavía (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"
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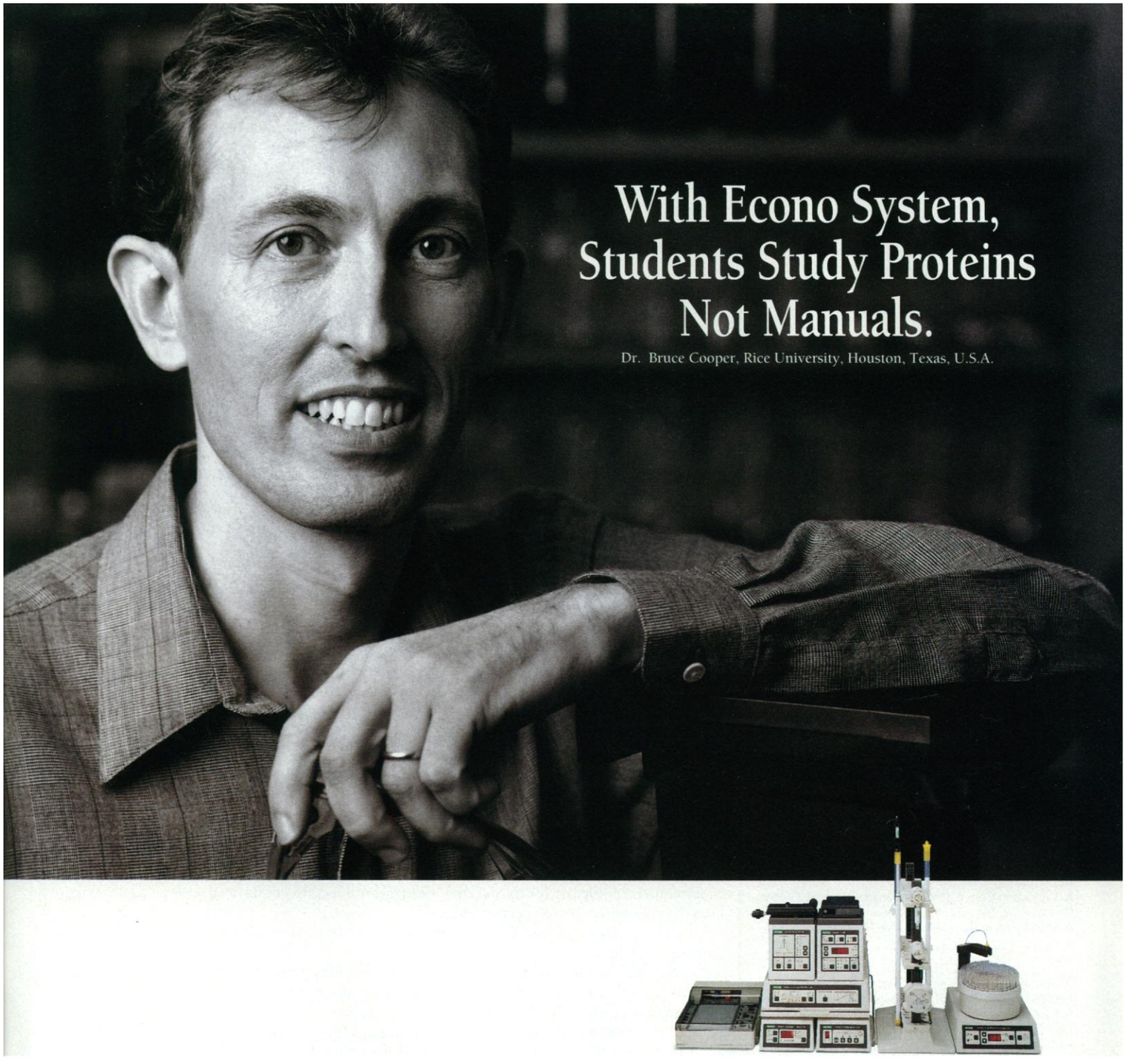

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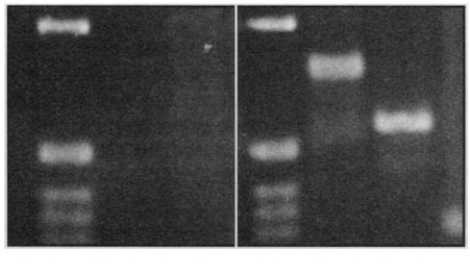

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* PCR is covered by U.S. Patent No. 4,683,202 issued to Cetus Corporation.

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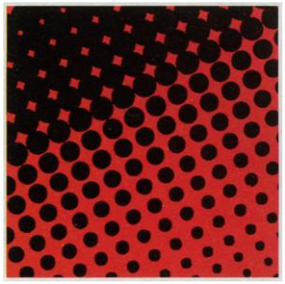

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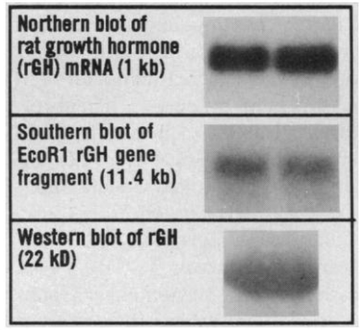

- **Total RNA** is isolated in 1 hour and is ready for studies of gene expression by Northern (See Figure) and dot blotting, poly A+ isolation, polymerase chain reaction (PCR*), RNase protection assay and molecular cloning. The simultaneous extraction of 100% of genomic DNA makes it possible to normalize the results of gene expression studies per DNA content instead of the more variable total RNA or tissue weight.
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- **Proteins** are isolated in 3 hours and are ready for Western blotting (See Figure).

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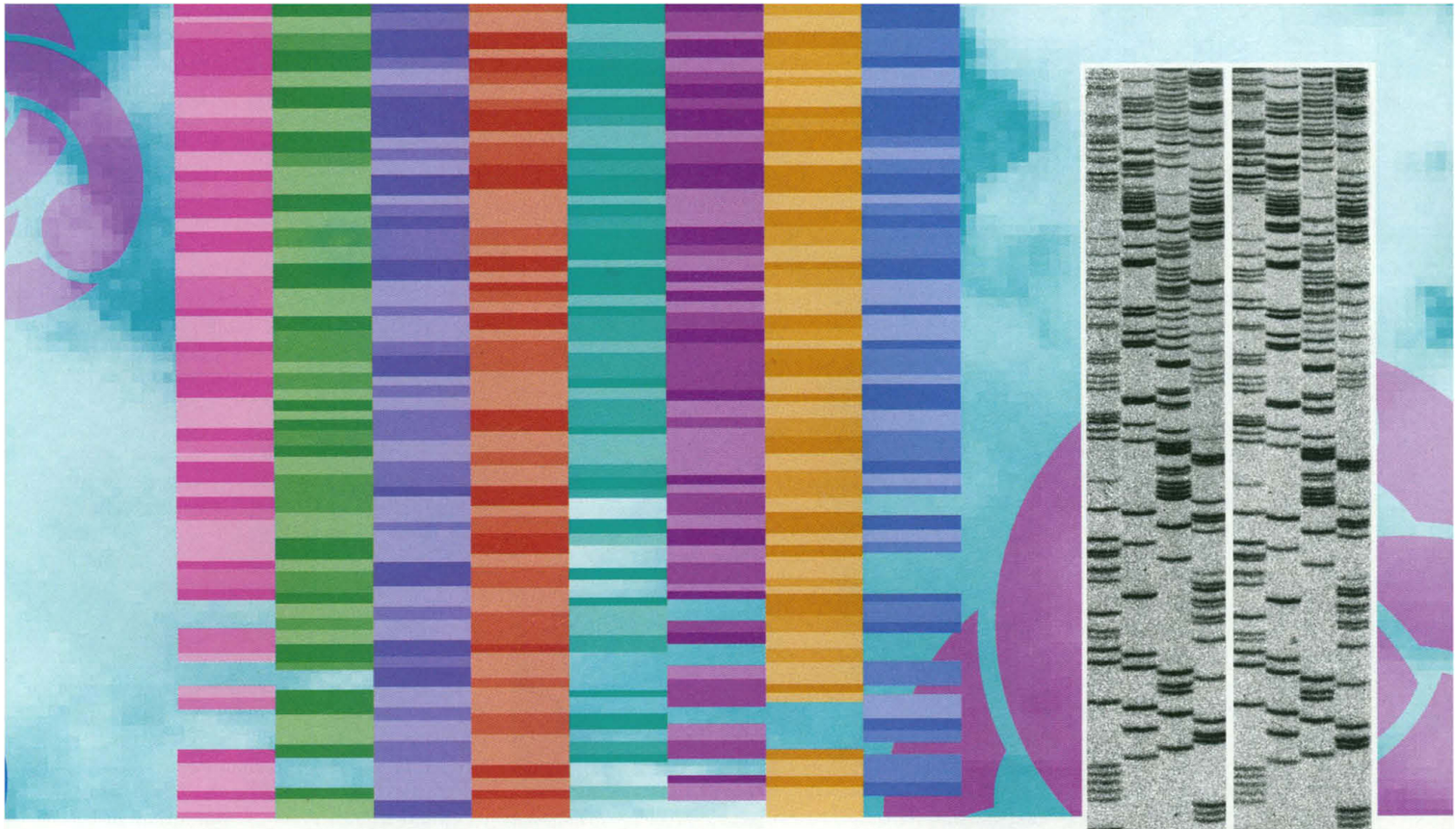

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References:

1. Ruan, C.C., and Fuller, C.W. (1991) *Comments 18*, No. 1, pp. 1-8, United States Biochemical Corporation, Cleveland, OH.
2. Siemieniak, D.R., Sieu, L.C., and Slightom, J.L. (1991) *Anal. Biochemistry 192*, 441-448.
3. Casanova, J.L., Pannetier, C., Jaulin, C., and Kourilsky, P. (1990) *Nucleic Acids Res. 18*, 4028.
4. Thein, S.L. (1989) *Comments 16* No.1, p. 8, United States Biochemical Corporation, Cleveland, OH .
5. Mitchell, L.G., Merril, C.R. (1989) *Anal. Biochemistry 178*, 239-242.
6. Pisa-Williamson, D. and Fuller, C.W. (1992) in *Comments* Vol. 19 No. 2, pp 29-36, United States Biochemical Corporation, Cleveland, OH.

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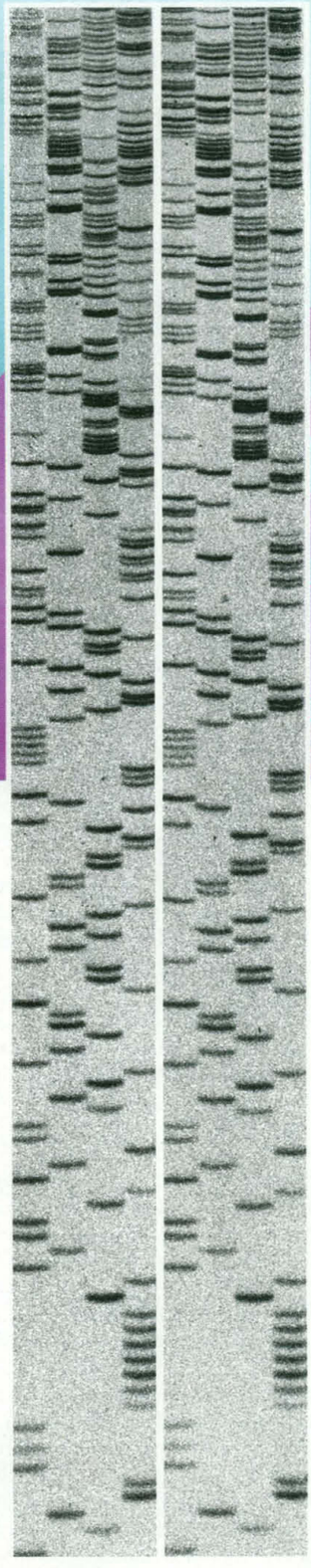

Example of Sequenase RapidWell Kit sequences which demonstrate the use of high reaction temperature and Glycerol Tolerant Sequencing Gels for sequencing double-stranded plasmid DNA.

Gordon Research Conferences

Alexander M. Cruickshank

The 1993 Summer and Fall Gordon Research Conferences will be held in New Hampshire, Rhode Island, and Germany. ATTENDANCE IS LIMITED—IT IS RECOMMENDED THAT APPLICANTS APPLY IMMEDIATELY FOR EARLY CONSIDERATION BY CHAIR.

Requests for applications to the Conferences, or for additional information address to: Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Gordon Research Center, University of Rhode Island, Kingston, RI 02881-0801. Telephone: 401-783-4011/3372 or FAX: 401-783-7644.

Mail for the office of the Director from 13 June to 20 August 1993 should be addressed to: Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Colby-Sawyer College, New London, NH 03257. Telephone: 603-526-2870 or FAX: 603-526-4717.

A special program for research-active faculty at predominately undergraduate institutions will operate in summer 1993. Some modest financial support may be available under the program. For information or an application, contact Dr. Richard W. Zuehlke at the Gordon Research Conferences office.

Science of Adhesion

New Hampton School, New Hampton, NH

H. M. Clearfield, chair; R. A. Dickie, vice chair

15–20 August

M. Chaudhury, "Relationship between adhesion hysteresis and the phase state of monolayer coating."

C. H. Mastrangelo, "Adhesion of microfabricated structure deflected by capillary forces."

J. L. Cercena, discussion leader

R. L. McCullough, "The origin and behavior of interphases in composite materials."

J. P. Wightman, discussion leader

J. F. Watts, "Evaluation of acid-base properties of materials by x-ray photoelectron spectroscopy."

J. A. Gardella, "Vibrational electron and mass spectrometry studies of Langmuir-Blodgett and self-assembled films at metal interfaces."

J. C. Hedrick, "Design of the thermoplastic-toughed polycyanurates."

A. C. Balazs, "Theoretical modeling of polymers at heterogeneous interfaces."

J. M. Calvert, "Selective deposition and adhesion with patterned, self-assembled films."

S. L. Cooper, "The role of adhesive proteins in blood-biomaterial applications."

L. G. Cima, discussion leader

E. J. Cheal, "Optimization of bonding for the femoral component of hip arthroplasty."

K. E. Healy, "Osteogenic cell attachment to and movement of chemically modified materials."

M. F. Mecklenburg, "Computer modeling of changes to paintings and photographs under environmental conditions."

J. Washiyama, "Toughening of polymer/polymer interfaces with block co-polymers."

K. A. Nelson, "Time-resolved spectroscopy of bulk and thin film polymers: Thermomechanical properties and adhesion."

Analytical Chemistry

New Hampton School, New Hampton, NH

L. D. Rothman, chair; M. Wirth, vice chair

8–13 August

Mass spectrometry

B. Chait, "New mass spectrometric approaches for studying proteins."

A. Marshall, "Two-dimensional multiplex mass spectrometry."

Spectroscopy

T. Harris, "Microscopy and spectroscopy with resolution exceeding diffraction limits."

TBA

Separations

M. Novotny, "Analytical and structural glycobiology: A scientific frontier for this decade."

P. Dasgupta, "Breaking barriers in analytical chemistry with membranes."

Imaging

D. Joy, "Analytical electron microscopy."

W. Weimer, "Photothermal spectroscopy: Characterizing materials of tomorrow."

Thermal analysis

L. Hansen, "101 things to do with isothermal and scanning calorimeters."

T. Hofelich, "Calorimetry in an inductrial environment."

New faculty members

Immunochemistry: M. Meyerhoff, discussion leader

F. Ligler, "Sensitive and quantitative analysis using a fiber optic biosensor."

M. Vanderlaan, "Immunoassays for trace chemical analysis: Monitoring toxic chemicals in humans, food, and the environment."

Chemometrics

TBA

TBA

TBA

Analytical Pyrolysis

Plymouth State College, Plymouth, NH

R. Lehrle, chair; B. Evans, vice chair

13–18 June

Mechanisms of pyrolysis: R. Lehrle, discussion leader

S. Tsuge, "PY-GC-MS studies of thermal degradation mechanisms of high polymers."

G. Zimmermann, "High-temperature organic gas phase chemistry."

P. Britt, "Fundamental investigations of pyrolysis mechanisms for biopolymers."

Geochemistry and biomaterials—(I): J. Boon, discussion leader

H. Meuzelaar, "Laser pyrolysis–MS of single micro-particles and macro-ions."

T. Weeding, "Multiphoton laser ionization of lignin and model compounds."

K. Voorhees, "Biomarkers in bacteria studied by pyrolysis tandem-MS."

Oxidative degradation of polymers—(I): N. Billingham, discussion leader

D. Carlsson, "Key intermediates in the oxidative degradation of polyolefins."

R. Clough, "Mechanisms underlying complex oxidation behaviors in polymers."

H. Lander, "The role of hydrocarbon pyrolysis in hypersonic aircraft."

Mass spectrometry and special techniques—(I): G. Montaudo, discussion leader

J. Scrivens, "Studies of polymer degradation under varying atmosphere."

C. Wilkins, "Laser desorption techniques for analytical Fourier-transform MS."

Geochemistry and biomaterials—(II): H. Meuzelaar, discussion leader

J. de Leeuw, "Relationships between biomacromolecules and their fossil counterparts."

G. Richards, "Chemistry of pyrolysis of polysaccharides."

R. Ishiwatari, "Chemical degradation GC-MS in studies of organic matter in recent sediments."

Oxidative degradation of polymers—(II): D. Carlsson, discussion leader

P. Klemchuk, "The chemistry of antioxidant action."

N. Billingham, "Physical factors influencing antioxidant loss."

B. Rånby, "Thermo-oxidative degradation and stabilization of photocrosslinked polyethylene."

Mass spectrometry and special techniques—(II): T. Székely, discussion leader

G. Montaudo, "Microstructure of copolymers by statistical modeling of their MS."

R. Srinivasan, "Controlled degradation and etching of organic polymers by pulsed UV laser radiation."

P. Sisson, "Pyrolysis-MS of bacteria from phenotype to genotype?"

Pyrolysis—general aspects: R. Evans, discussion leader

T. Wampler, "What can be said to the pyrolysis skeptics?"

A. Shedrinsky, "Recent developments and old problems in the application of analytical pyrolysis in art, conservation, and archaeology."

R. Lattimer, discussion leader

Animal Cells and Viruses

Tilton School, Tilton, NH

K. V. Holmes and R. A. Lamb, co-chairs

20–25 June

Nucleic acid replication: S. Schlesinger and L. A. Ball, discussion leaders

S. Schlesinger, TBA

T. Kelly, "Initiation of SV-40 DNA replication."

L. A. Ball, "Replication and recombination of viral RNA."

D. Hayward, "Dual role of the Epstein-Barr virus 2ta protein in transcriptional activation and DNA replication."

Viral gene expression: D. Baltimore and P. Sharp, discussion leaders

D. Baltimore, "NF-kB, a regulator of many viral and cellular genes."

P. Sharp, "Regulation of transcription by complexes of proteins."

A. Berk, "Interaction of adenovirus E1A with holo-TFIID activates early gene transcription."

B. Moss, "Intermediate and late stage–specific transcription factors."

Nucleic acid transport and translation: N. Sonenberg and G. Dreyfuss, discussion leaders

N. Sonenberg, "Cap-independent translation by internal initiation on picornavirus mRNAs."

G. Dreyfuss, "hnRNP proteins: Chaperones of pre-mRNAs and mRNAs?"

R. M. Krug, "Regulation of nuclear export of RNA by the influenza virus NS1 protein."

B. Cullen, "RNA sequence–mediated gene regulation in HIV-1."

Viral penetration and disassembly: R. Rueckert and J. White, discussion leaders

R. Rueckert, "Picornaviral maturation cleavage: Why is it needed for infectivity?"

J. Hogle, "Poliovirus structure and cell entry."

J. White, "Promotion and inhibition of influenza virus fusion."

M. Nibert, "Early steps in reovirus infections."

G. Nemerow, "Identification of cell receptors for adenovirus internalization."

Viral assembly: M. Estes and R. Compans, discussion leaders

M. Estes, "Assembly of gastroenteritis viruses."

H. Garoff, "Virus budding."

L. Enquist, "Assembly and transport of AAV, a neurotropic herpesvirus, in the mammalian CNS."

J. Rose, "Assembly of VSV and HIV-1."

R. Doms, "Assembly of intra- and extracellular forms of vaccinia virus."

Host-dependent replication of viruses: G. Miller and T. Broker, discussion leaders

G. Miller, "Cell-specific and promoter-specific action of the EBV ZEBRA protein."

J. Stevens, "Replicating, latent, and reactivating herpesvirus-neuronal interactions."

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

M. Martin, "Virological and cellular determinants of HIV infectivity."

L. Chow, "Production of human papillomavirus and modification of the infectious program in epithelial cells cultured on dermal equivalents."

Virus-induced modulation of cell growth: C. Prives and D. Livingston, discussion leaders

C. Prives, "Structure and function of tumor suppressor proteins and their interactions with SV-40 and poloma large tumor antigens."

D. Livingston, "Functional analysis of the retinoblastoma gene product and related proteins."

M. Castan, TBA

J. Huibregtse, "Interactions of the human papillomavirus E6 oncoprotein with p53 and the ubiquitin proteolysis system."

E. Kieff, "Mechanisms of alteration of B lymphocyte growth in EBV infection."

Immune responses to virus infection: R. Ahmed and D. Griffin, discussion leaders

R. Ahmed, "Cytokine—escape viral variants."

J. Yewdell, "Cell biology of antigen processing and presentation."

P. Greenberg, "Immunobiology of the protective CD8-positive T cell response to human CMV."

Viral pathogenesis: K. Berns and J. Stevens, discussion leaders

D. Griffin, TBA

K. Berns, "The relationship between ALV latency and cancer."

V. Racaniello, "Virus-receptor interaction in poliovirus pathogenesis."

M. McCune, "Mechanisms of HIV pathogenesis in vivo."

Applied and Environmental Microbiology

Colby-Sawyer College, New London, NH

C. E. Cerniglia, chair; J. Suflita, vice chair

11–16 July

Bioremediation: Field experience: P. H. Pritchard, discussion leader

J. G. Mueller, "Advances in the use of microbial inoculants for the bioremediation of soil and water contaminated with organic wood preservatives."

D. L. Bedard, "Activating microbial dechlorination of PCB's in the field."

L. Semprini, "Comparison of field studies of TCE degradation by methane and phenol utilizing bacteria."

Bioremediation: Field experience: G. W. Sewell, discussion leader

R. Crawford, "Anaerobic bioremediation of soils contaminated by munitions compounds."

A. D. Venosa, "Strategies in conducting field studies of oil spill bioremediation."

Subsurface microbiology: J. Suflita, discussion leader

J. Fredrickson, "Contrasting subsurface lifestyles: Vadose zone survivors vs. basalt aquifer lithotrophs."

D. Lovley, "Anaerobic microbial metabolism in petroleum-contaminated aquifers."

M. McInerney, "Bacterial growth and movement in subsurface materials: Applications for oil recovery."

Microorganisms/extreme environments: J. Wiegel, discussion leader

J. S. Dordick, "Biocatalysis under extreme environments."

B. Javor, "Biogeochemical interactions in hypersaline environments."

Microbial metabolism and biotransformations: C. E. Cerniglia, discussion leader

L. Wackett, "Enzyme mechanisms in cometabolic dehalogenation reactions and the construction of novel metabolic pathways."

S. Copley, "Enzymic dehalogenation of halogenated aromatic compounds."

W. B. Whitman, "Developments in the physiology and genetics of methanococcus, a methanogenic archebacterium."

Microbial metabolism and biotransformations: R. Fallon, discussion leader

F. Kawai, "Bacterial degradation of polyethers and polyacrylate."

T. Federle, "Biodegradation of a polycarboxylate ether: A tale of three stereoisomers."

Microbial interactions with inorganic materials: T. Barkay, discussion leader

W. T. Frankenberger, "Microbial volatilization of selenium from soils, sediments, and water."

A. H. Goldstein, "The biochemical and genetic basis for conversion of rock phosphate ore to Pi by Gram-negative bacteria."

A. O. Summers, "A mercury metal vapor biosensor."

J. Cooney, discussion leader

W. L. Rathje, "Landfill archaeology: Exposing America's garbage life-styles."

Food and fermentation microbiology: G. J. Haas, discussion leader

A. L. Demain, "Regulation of secondary metabolism–molecular genetic aspects."

I. Labuda, "Microbial derivation of flavor compounds."

W. Hill, "Gene probes and the polymerase chain reaction: Food safety applications."

Poster sessions will be held Monday, Tuesday, and Wednesday from 4:00 p.m. to 6:00 p.m. and after the evening sessions. Those wishing to submit posters should submit a brief abstract by 11 June 1993 to Dr. Joe Suflita, Department of Botany and Microbiology, University of Oklahoma, 770 Van Vleet Oval, Norman, OK 73019-0245. Telephone: 405-325-5734/FAX: 405-325-7619.

Atherosclerosis

Kimball Union Academy, Meriden, NH

J. L. Witztum and S. Coughlin, cochairs

20–25 June

Lipoproteins and their receptors: R. J. Havel, discussion leader

J. Herz, "LDL receptor knockouts and gene therapy."

J. Wilson, "Gene therapy for hypercholesterolemia."

L. Chan, "Apo B overexpression in transgenics."

C. Glass, "Transcriptional control of scavenger receptor."

Transgenic mouse models of atherosclerosis models: D. Steinberg, discussion leader

E. Rubin, "Antiatherogenic properties of different HDL species in transgenic mice."

A. Plump, "Atherosclerosis in gene knockout and transgenic mice."

S. Fazio, "Transgenic mice overexpressing dysfunctional Apo E."

TBA, "Mouse models of human vascular disease: Pros and cons."

Lipoproteins and cell activation: A. Fogelman, discussion leader

R. Ross, "Lipid oxidation, growth regulation molecules, and atherosclerosis."

J. Berliner, "Mechanism by which oxidized LDL activates inflammatory responses."

T. Collins, "Transcriptional control of ELAM and VCAM."

M. Gimbrone, "Endothelial cell gene regulation by hemodynamic stress."

Cell adhesion: R. Cotran, discussion leader

M. Ginsberg, "Dynamics of integrin activation."

D. Wagner, "P-Selectin knock out."

Coagulation and atherosclerosis: H. Hobbs, discussion leader

M. Davies, "The factors initiating thrombosis on human atherosclerotic plaques."

S. Coughlin, "Thrombin receptor: Structure and function."

J. Wilcox, "Thrombin and proliferative responses to vascular injury in primates."

R. Lawn, "Atherosclerosis in Lp(a) transgenic mice."

Growth factors and cytokinesL role in vivo: P. Davies, discussion leader

P. Libby, "Cytokine gene expression in diseased vessels in vivo."

G. Nabel, E. Nabel, "Modification of vascular cell phenotypes by direct gene transfer into the artery wall."

Cell signaling and transport: G. Getz, discussion leader

G. Palade, "Macromolecular transport across the vascular endothelium."

R. Rosenberg, "Mechanisms of smooth muscle cell proliferation."

J. L. Goldstein, "From cholesterolemia to choroidermia."

L. T. Williams, "Signaling molecules that mediate the actions of growth factors."

New directions: S. Young, discussion leader

M. Farquhar, "gp330/44–Heymann nephritis antigenic complex: Relationship to LRP/RAP."

L. Demer, "Mechanism of plaque calcification."

D. Harrison, "Effects of atherosclerosis on vasomotion."

M. Mitchinson, "Macrophages in atherosclerosis—a matter of life and death."

Atmospheric Chemistry

Salve Regina University, Newport, RI

D. M. Golden and M. Prather, cochairs; J. Logan, vice chair

20–25 June

Atmospheric chemistry: Observations, models and predictions: C. Kolb, discussion leader

D. Jacob, "Global tropospheric ozone."

M. Schoebrl, "Stratospheric ozone depletion."

J. Penner, "Aerosols and clouds."

Symposium in honor of Jack Calvert's 70th birthday: J. Pitts, discussion leader

R. Cicerone, "Methyl bromide emissions from fumigated fields."

K. Demerjian, "Ozone in the free troposphere."

A. Kerr, "Atmospheric photooxidation: An experimental perspective."

M. Hoffman, "Photochemical production of hydrogen peroxide in clouds."

Laboratory studies: B. Finlayson-Pitts, discussion leader

G. Moortgat, "Atmospheric photooxidation of hydrocarbons: Current issues."

M. Tolbert, "Heterogeneous chemistry."

A. Ravishankara, "Photochemistry."

Atmospheric measurements: What have we learned?: M. Kurylo, discussion leader

D. Toohey, "Evidence for atmospheric processing by heterogeneous chemistry."

H. Akimoto, "Tropospheric ozone increase in Japan."

Atmospheric measurements: What have we learned?: D. H. Ehhalt, discussion leader

E. Browell, "Aircraft investigation of tropospheric ozone."

H. Singh, "NO_x and hydrocarbons."

C. Brock, "The impact of the eruption of Mount Pinatubo on the stratospheric aerosol."

Atmospheric measurements: What have we learned?: M. A. Carroll, discussion leader

D. Parrish, "Regional studies of oxidant formation."

D. Crosley, "HO_x detection: Application to global tropospheric chemistry."

Can we make valid scientific assessments of: TBA, discussion leader

R. Stolarski, "Effects of aircraft on the atmosphere."

J. Rodriquez, "The impact of proposed CFC substitutes on the stratosphere and troposphere."

A. G. Russell, "Ozone control strategy formulation."

Future directions: J. Moyers, discussion leader

TBA, "Government plans and programs."

TBA, "Environmental thrusts in the Clinton Administration."

Global connections: M. Molina, discussion leader

J. Hansen, "Chemistry feedback on climate."

J. Holton, "What have we learned from UARS."

Atomic Physics

Brewster Academy, Wolfeboro, NH

W. D. Phillips, chair; C. Greene, vice chair

4–9 July

Atoms in strong electromagnetic fields

K. Kulander, "Above-threshold ionization and high harmonic generation."

P. Koch, "Microwave ionization of hydrogen."

R. Jones, "Rydberg atom wavepackets and photoionization."

Monte Carlo wavefunctions: A new theoretical method for quantum optics: K. Molmer, discussion leader

Y. Castin, "The Monte Carlo wavefunction technique."

P. Zoller, "New results from MCWF calculations."

New frontiers for atomic hydrogen: N. Ramsey, discussion leader

G. Gabrielse, "Toward anti hydrogen."

J. Walraven, "Laser cooling of trapped hydrogen."

T. Hänsch, "Advances in precision spectroscopy of hydrogen."

Correlation effects in atoms and negative ions: C. Greene, discussion leader

J. Peterson, "Negative ion photodetachment."

F. Robicheaux, "Electron correlation in photoionization."

Laser cooling: D. Wineland, discussion leader

S. Chu, "Cooling below the recoil limit."

S. Rolston, "Quantized motion of laser-trapped atoms."

Atom optics

J. Mlynek, "Recent progress in atom optics."

Coherence, transparency, population trapping, and adiabatic transfer: S. Harris, discussion leader

Atoms in static fields: P. O'Mahoney, discussion leader

H. Walther, "Spectrum of H in electric and magnetic fields."

Biocompatibility and Biomaterials

Tilton School, Tilton, NH

J. L. Brash, chair; B. D. Ratner, vice chair

11–16 July

Proteins at interfaces: J. Brash, discussion leader

H. Elwing, "Structural stability of proteins adsorbed to nanospheres, CD, and fluorescence measurements."

V. Haldy, "The role of surface heterogeneity in biomaterial-protein interactions."

K. Park, "Prevention of protein adsorption and cell adhesion."

Cells at interfaces: T. Horbett, discussion leader

J. Steele, "Role of serum proteins in attachment of endothelial cells and bone-derived cells to synthetic polymer surfaces."

L. Culp, "Cell type–specific modulation of fibronectin functions on chemically derivatized substrata."

M. Jozefowicz, TBA

Infection and biomaterials: J. Anderson, discussion leader

G. Pier, "Adherence, persistence, and dissemination of bacteria from biomedical devices."

M. Hook, "Molecular mechanisms of microbial adhesion."

W. Costerton, "Control of biofilm formation on medical devices."

The immune response and biomaterials: D. Gibbons, discussion leader

P. Parks, "Immune-mediated disease and implanted silicone."

H. Smith, "Immunology of breast implants."

N. Kossovsky, "Bioreactivity of silicone."

Blood-biomaterial interactions: J. Jozefonvicz, discussion leader

P. Johnson, "Blood interactions at the biomaterial native vessel interface."

M. Sefton, "What happens to platelets when they don't stick to the surface?"

TBA

New materials I, calcium phosphate ceramic coatings for surgical implants: J. Lemons, discussion leader

W. Lacefield, "Dissolution/resorption."

R. Pilliar, "Fracture/fatigue."

P. Ducheyne, "Overview."

New materials II: B. Ratner, discussion leader

S. Stupp, "Organoapatites: New materials for artificial bone."

J. Hickman, "Patterned self-assembled monolayers as templates for controlled in vitro cellular networks."

D. Tirrell, "New polymeric materials through genetic engineering."

J. Brash, discussion leader

D. Williams, TBA

Tissue engineering: J. Hubbell, discussion leader

P. Aebischer, "Reconnection of neural circuits by bioartificial means."

D. Barritault, "Functional analogs of heparan sulfates as wound healing agents."

J. Brauker, TBA

Bioenergetics

Holderness School, Plymouth, NH

R. Gennis, chair; R. Fillingame, vice chair

4–9 July

Electron transport I: P. Rich, discussion leader

M. Wikström, "Structural and functional aspects of catalysis by cytochrome oxidase."

S. Ferguson-Miller, "Insight into the mechanism of electron and proton transfer from analysis of site-directed mutants of cytochrome c oxidase."

W. L. Hubbell, "Site-directed spin label studies of the structure and dynamics of membrane proteins."

Electron transport II/myopathies: H. Weiss, discussion leader

J. E. Walker, "The structure of bovine complex I."

D. C. Wallace, "Mitochondrial genetics: A paradigm for aging and degenerative diseases."

ATPase I: P. Pedersen, discussion leader

S. D. Dunn, "b subunit of *E. coli* ATP synthase."

R. L. Cross, "Nucleotide binding sites on F_1-ATPases."

P. Graber, "The effect of membrane energization on uni-site catalysis of the H^+-ATPase from chloroplasts."

Conformational switching in membrane proteins: S. Chan, discussion leader

D. E. Koshland, Jr., "Transmembrane signaling mechanisms and the aspartate receptor."

D. D. Oprian, "Constitutively active mutants of rhodopsin."

Round-table discussions

ATPase II: D. Perlin, discussion leader

C. W. Slayman, "Site-directed mutagenesis of the yeast plasma-membrane (H^+)-ATPase."

Y. Anraku, "Molecular genetics and biochemistry of the yeast vacuolar H^+-ATPase."

Kinetics of proton and electron movements: T. Crofts, discussion leader

P. L. Dutton, "Ubiquinone redox catalysts and intraprotein electron transfer in cytochrome bc_1 complex."

F. Millett, "Conformational control of interprotein electron transfer."

C. Wraight, "Coupling of protons and electrons in the photosynthetic reaction center."

D. Oesterhelt, "The common vectorial catalytic principle in bacteriorhodopsin and halorhodopsin."

Regulation of ATP synthesis: K. Van Dam, discussion leader

R. G. Hansford, "Dehydrogenase activation by Ca_{2+}."

K. F. LaNoue, "Correlations of mitochondrial ATP synthesis with mitochondrial electrical potential gradient. Free cytosolic Ca_{2+} and work load in perfused rat hearts."

T. A. Krulwich, "Oxidative phosphorylation in alkaliphiles."

Biological Regulatory Mechanisms

Holderness School, Plymouth, NH

C. Georgopoulos and C. M. Kane, co-chairs

13–18 June

Transcriptional control: M. J. Chamberlin, discussion leader

R. Ebright, "Mechanism of transcription activation by CAP protein."

D. Kolakofsky, "Paramyxovirus mRNA editing."

Intracellular sorting: S. Ferro-Novick, discussion leader

A. Helenius, "Protein folding."

H. Lodish, "Protein folding and degradation in the endoplasmic reticulum."

S. Michaelis, "A-factor processing and biosynthesis."

Morphogenesis and regeneration: A. D. Kaiser, discussion leader

E. M. Meyerowitz, "Genetic control of flower development."

H. R. Boda, "Head regeneration in *Hydra*."

A. Kuspa, "Tagging morphogenetic genes in *Dictyostelium*."

D. Kingsley, "The mouse short ear gene and the function of bone morphogenetic proteins in normal development."

Host invasion: Parasites, pathogens, symbionts: S. Long, discussion leader

Environmental stress responses: S. Lindquist, discussion leader

C. Georgopoulos, "The DnaK chaperone machine."

J. Lis, "RNA polymerase II pausing in the mechanism of transcriptional control."

R. Morimoto, TBA

Macromolecular breakdown and stability: D. Finley, discussion leader

A. Sachs, "Messenger RNA degradation in yeast."

Mating behavior: R. Kahmann, discussion leader.

S. Dellaporta, "Sex determination in plants—a programmed cell death process."

L. D. Hurst, TBA

G. Sprague, "Signal transduction in yeast mating."

J. Horabin, "Sex determination in *Drosophila*: Different mechanisms for soma and germ line."

Sensing and thinking: S. Heinemann, discussion leader

R. Scheller, "Mechanism of synaptic vesicle release."

M. A. Hediger, "Structure and function of a neuronal glutamate receptor transporter."

Cell cycle controls, A. Murray, discussion leader

T. Davis, "Functions of calmodulin during cell proliferation."

R. Deshaies, TBA

Bioorganic Chemistry

Proctor Academy, Andover, NH

P. Bartlett and G. Trainor, co-chairs

13–18 June

Protein Engineering

TBA

G. Stetler, "The redesign of human hemoglobin progress toward the development of a cell-free blood substitute."

A. Scheparz, "A chemical perspective on protein folding and DNA protein interactions."

Novel architectures

TBA

D. Dougherty, "Cation-π interactions in artificial and natural receptors."

R. Zuckerman, "Automated synthesis and affinity selection of biopolymer libraries."

Peptides and protein—I

TBA

J. Kelly, "Strategies for the preparation of structurally well-defined β-sheets in aqueous solutions."

TBA

Metals in bioorganic chemistry

H. W. Liu, "Mechanistic studies on Acyl-CoA dehydrogenas."

J. Berg, "Zinc fingers."

TBA

Medicinal chemistry

P. Lam, "Computer-aided design and discovery of potent, non-peptide HIV protease inhibitors."

S. Reich, "Protein structure-based design of non-peptide HIV protease inhibitors."

J. Blaney, "Conformationally flexible docking and de novo drug design."

Peptides and protein—II

B. Imperiali, "Perspectives in the de novo design of functional proteins."

Y. Guindon, "Inhibition of HSV ribonucleotide reductase by subunit dissociation."

G. Verdine, "Protein-DNA interactions."

Nucleic acids

C. Townsend, "Calicheamycin: Understanding and application of drug activation and DNA cleavage chemistry."

TBA

P. Nielsen, "Chemical and biological properties of peptide nucleic acids (PNA)."

Enzyme mechanisms

P. Dowd, "On the mechanism of action of vitamin K."

G. Matcham, "The stereochemistry of transamination and enzymatic production of optically active amines."

Biorheology of Cell Adhesion

New England College, Henniker, NH

M. M. Frojmovic, chair; H. Goldsmith and L. McIntire, co–vice chairs

13–18 June

Physical-chemical forces in cell adhesion: D. Lauffenburger, discussion leader

E. Evans, "Forces in lipid/protein interactions."

T. van de Ven, "Colloidal forces in flow."

Physical and molecular modeling of cell adhesion: D. Hammer, discussion leader

T. Springer, "Adhesive receptors and ligands."

M. Dembo, "Physical-chemical determinants of cell adhesion."

Mechanics and effects of cell deforma-

tion in adhesion: R. Waugh, discussion leader

R. Hochmuth, "Cell mechanical properties in adhesion."

A. Tozeren, "Visoelastic properties of cytoskeletal polymers."

Cell adhesion in flow using reconstituted receptor ligand surfaces: T. Springer, discussion leader

D. Lauffenburger, "Surface receptor-mediated mechanisms."

M. Lawrence, "Effects of adhesion receptor mobility."

Cell adhesion in flow centered on reconstituted adhesive protein surfaces: V. Turitto, discussion leader

P. de Groot, "Shear rate–dependent adhesion to extracellular matrix proteins."

G. Truskey, "Cell spreading and strength of adhesion in flow."

Flow modulation of receptor specificity in cell adhesion: Y. Ikeda, discussion leader.

L. McIntire, "Flow modulation of receptor specificity in cell adhesion."

D. Hammer, "Effects of receptor-ligand chemistry on the rolling and adhesion of cells under shear flow."

Flow modulation of receptor specificity and cell aggregation: H. Goldsmith, discussion leader

D. Hellums, "Role of adhesive proteins in regulating shear-induced aggregation."

M. Frojmovic, "Flow-dependent aggregation of blood cells and adhesion receptor expression."

Z. Ruggeri, "Mechanisms of platelet adhesion and thrombus formation."

Effects of shear stress on cell (surface) properties: D. Ingber, discussion leader

P. Davies, "Shear-induced signal transduction in the endothelium."

L. McIntire, "Regulation of gene expression in cells as a function of shear."

Adhesion receptors (integrins) as bidirectional mechano-chemical transducers: P. Davies, discussion leader

D. Ingber, "Bidirectional mechano-chemical transducers."

M. Opas, "Transduction of cell structure and function by mechanical changes in the extracellular matrix."

Thursday afternoon will be devoted to a poster session on "New Frontiers in the Biorheology of Cell Adhesion," where the vice chair for this session, Professor Larry McIntire, with his committee, will invite a few oral presentations integrated as third/fourth speakers (10 minutes each) within the regular session.

Bones and Teeth

Kimball Union Academy, Meriden, NH

J. Heersche, chair; S. Goldring, vice chair

11–16 July

Molecular biology of bone development and osteoblast differentiation: J. Aubin, discussion leader

D. M. Kingsley, "BMP-5 gene alterations in short ear skeletal morphogenesis mutants."

M. Noda, "Helix-loop-helix transcription factors in osteogenesis."

R. Cancedda, "Chondro-osteodifferentiation in vitro."

Ultrastructural and molecular aspects of bone mineralization: W. Landis, discussion leader

W. Landis, "Advances in the structural analysis of mineralization."

D. Heinegard, "Bone matrix macromolecules with roles in bone assembly and disassembly."

L. Addadi, "Selective interactions of cells with crystal substrates."

Proto-oncogenes, osteoblasts, and osteopetrosis: G. Mundy, discussion leader

B. Spiegelman, "Role of fos in osteoclast biology and adipocyte differentiation."

B. F. Boyce, "Role of src oncogene in osteoclast function."

R. Baron, "Potential roles of the src proto-oncogene in osteoclasts."

Molecular biology of head and tooth development: E. Kollar, discussion leader

M. Ferguson, M. Snead; speakers

Structure-function relationships of the various domains of peptide hormones, particularly the PTH-CT receptor family: S. Goldring, discussion leader

D. Ausiello, "The superfamily of G protein–coupled receptors."

H. Juppner, "The biology of the PTH-PTHrP receptor."

A. Goren, "Characterization of the calcitonin receptor."

Families of G proteins and their roles in signal transduction: R. A. Nissensson, discussion leader

A. Spiegel, "G proteins."

M. Levine, "G protein mutations in pseudohypoparathyroidism and McCune-Albrights syndrome."

Cytokines and cytokine-inhibitors: Roles in bone remodeling and inflammation: J. M. Dayer, discussion leader

R. G. Russell, "Cytokine interactions in bone and cartilage."

J. Breenan, "Cytokine regulation in rheumatoid arthritis: A pivotal role for TNF-α."

R. Lessloer, "TNF: Receptors and inhibitors."

R. Nelson, "The bear bones of hibernation."

Osteoporosis: The cell biology of drug treatment as evaluation by bone histomorphometry: M. Parfitt, discussion leader

M. Parfitt, "Bone histomorphometry: The bridge between cell biology and clinical investigation."

E. Eriksen, "Effects of anti-resorptive agents on remodeling mechanisms."

D. Baylink, "Effect of formation-stimulating agents on remodeling mechanisms."

Calcium Oxalate

Plymouth State College, Plymouth, NH

H. T. Horner, chair; H. E. Williams, vice chair

20–25 June

Modern methods of calcium and oxalate determination and recognition: R. A. L. Sutton, discussion leader

S. Langley, "The measurement of ionized calcium in urine and other bodily fluids."

A. Hesse, "Urinary oxalic acid: Methods of determination, biorhythm, and nutritional factors."

D. L. Purich, "Carboxylic ligands as modulators in COM urolithiassis: A molecular recognition approach."

Molecular and cell biology of two systems: L. P. Smith, discussion leader

C. J. Danpure, "Molecular and cell biology of primary hyperoxaluria type I."

M. B. Saffo, "Calcium oxalate in molgulid tunicates: Is oxalate linked to urate degradation?"

Molecules that influence crystal formation: G. H. Nancollas, discussion leader

P. Rock, "A computer model of complexation inhibitors of calcium oxalate stone formation."

J. D. Sallis, "The 'propane carboxylate' family of growth formation inhibitors."

N. Mandel, "Crystal-crystal and cell surface interactions."

Molecular biology of crystal formation and oxalate catabolism: R. P. Holmes, discussion leader

X. Li, "Molecular aspects of calcium oxalate deposition and regulation in plants."

A. B. Peck, "Oxalate catabolism: A molecular genetics approach with application to human disease."

Molecular biology, metabolism and degradation of oxalate: M. J. Allison, discussion leader

M. A. Webb, "Immunochemical studies of the matrix associated with calcium oxalate formation in *Vitis* (grape)."

R. A. J. Conyers, "The metabolic production of oxalate: A review of the evidence for roles for ascorbic acid and glycine."

N. Cornick, "Biosynthetic pathways in *Oxalobacter*: Flow of carbon from oxalate and acetate."

Bacterial enzymology and oxalate transport: D. Wilson, discussion leader

J. Costello, "Manipulation of urinary oxalate by feeding *Oxalobacter formigenes* to rats and the possible significance of *Oxalobacter* in the extrarenal excretion."

M. Hatch, "Mechanisms of oxalate handling by intestine."

Mechanisms of cellular transport of calcium and oxalate: M. Menon, discussion leader

B. Baggio, "Red blood cells and renal abnormalities in oxalate transport in calcium oxalate nephrolithiasis."

V. R. Franceschi, "Mechanisms of calcium transport during calcium oxalate formation in plants."

T. Wandzilak, "The effect of second messenger systems on oxalate uptake."

Main conference address: H. T. Horner, discussion leader

H. J. Arnott, "Calcium oxalate scholarship—the case for multidisciplinary interaction."

Calcium oxalate crystal growth and kinetics: R. L. Ryall, discussion leader

D. J. Kok, "Control of particle size, a protective mechanism against calcium oxalate urinary stone formation."

A. Rodgers, "Aspects of calcium oxalate growth and kinetics in urine—methods and models."

Calcium Signaling

New England College, Henniker, NH

D. L. Gill, chair; J. W. Putney, Jr., vice chair

20–25 June

Ca^{2+} signal initiation: Phospholipase C activation: J. W. Putney, Jr., discussion leader

S. G. Rhee, "Regulation of phospholipase C isizymes."

J. H. Exton, "G proteins coupled to phospholipase C."

G. Carpenter, "Tyrosine phosphorylation of PLC_γ."

Inositol phosphates and intracellular Ca^{2+} regulation: R. F. Irvine, discussion leader

J. W. Putney, Jr., "Inositol phosphates and calcium entry."

L. Missiaen, "Is the Ins(1,4,5)p_3-receptor controlled by luminal Ca^{2+}?"

R. F. Irvine, "The second messenger function of $InsP_4$."

Intracellular Ca^{2+} channels: S. H. Snyder, discussion leader

K. Mikoshiba, "Molecular properties of the $InsP_3$ receptor and its role in Ca^{2+} signaling."

T. C. Südhof, "Neuronal $InsP_3$ receptors: Mode of action and possible functional significance."

B. Ehrlich, "Functional comparison of $InsP_3$ and ryanodine receptors."

S. H. Snyder, "Inositol phosphates and calcium disposition."

Plasma membrane Ca^{2+} channels: R. W. Tsien, discussion leader

R. W. Tsien, "Structural basis of the functional diversity of Ca^{2+} channels."

R. Penner, "Receptor-mediated calcium influx mechanisms."

R. Coronado, "Scorpion toxins as probes of ryanodine receptor structure and function."

Intracellular Ca^{2+} regulatory organelles: D. L. Gill, discussion leader

A. P. Somlyo, "Subcellular localization of calcium and calcium channels."

J. Meldolesi, "Rapidly exchanging Ca^{2+} stores: Structure, composition and function."

D. L. Gill, "Ca^{2+} pool function and organization."

I. Schulz, "Functional characterization of Ca^{2+} transport mechanisms in pancreatic acinar cells."

Temporal control in intracellular Ca^{2+}: M. J. Berridge, discussion leader

O. Petersen, "Cytosolic Ca^{2+} oscillations evoked by constant $InsP_3$ level: Localized Ca^{2+} signals and Ca^{2+} waves."

T. Meyer, "Local and global aspects of repetitive calcium spikes."

P. Cobbold, "Agonist specificity in calcium oscillations."

Spatial control of intracellular Ca^{2+}: R. Y. Tsien, discussion leader

D. E. Clapham, "Organization of calcium waves in *Xenopus* oocytes."

R. Y. Tsien, "A diffusible messenger generated by emptying of intracellular Ca^{2+} stores."

A. P. Thomas, "Functional and spatial organization of calcium stores in single cells."

N. Allbritton, "The range of action of Ca^{2+} and $InsP_3$."

M. J. Berridge, "Spatiotemporal aspects of calcium signaling."

Ca^{2+} signals and cell growth: E. Rozengurt, discussion leader

A. R. Means, "Calcium and calmodulin regulation of the proliferative cell cycle."

E. Rozengurt, "Ca^{2+}-mobilizing neuropeptides as cellular growth factors."

W. Moolenaar, "Ca^{2+}-dependent signaling pathways induced by lysophosphatidate, a platelet-derived lipid mitogen."

Cancer

Salve Regina University, Newport, RI

B. R. Zetter, chair; R. Miesfeld, vice chair

15–20 August

Signaling mechanisms in normal and transformed cells

Life and death: Cell growth and viability: O. Witte, discussion leader

O. Witte, "Regulation of hematopoietic cell growth by cytoplasmic tyrosine kinases."

S. Courtneidge, "Regulation and function of *src* family tyrosine kinases."

D. Goeddel, "TNF receptor signaling."

Extracellular matrix mediated signals: M. Bissell, discussion leader

M. Bissell, "Interaction of normal and malignant cells with the extracellular matrix."

M. Newman, "Role of extracellular signals in the cellular response to TGF-β."

R. Juliano, "The role of integrins in signal transduction and control of tumor growth."

Membrane-linked signals: M. Waterfield, discussion leader

M. Resh, "Membrane interactions of myristylated *src* family members."

L. Cantley, "Phosphatidylinositol 3-kinase."

M. Waterfield, "Structure and function of the signal transduction protein complex."

Cytoskeleton linked signals: L. B. Chen, discussion leader

L. B. Chen, "Tensin, a focal contact protein involved in signal transduction."

T. Parsons, "Signal transduction via focal adhesion–associated tyrosine kinases."

D. Coffey, "The cancer cell: Structure and function."

Regulators of *ras* function: L. Feig, discussion leader

L. Feig, "The regulation of *ras* activation."

B. Tocque, "Mechanistic aspects of signaling through *ras* in fibroblasts."

F. McCormick, "Regulators and effectors of *ras* p21 proteins."

C. Der, "Protein prenylation and *ras* transformation."

Suppression and enhancement of tumor development and metastasis: P. Steeg, discussion leader

A. Greenberg, "Molecular control of tumor motility and invasion."

P. Steeg, "Biochemical properties associated with *nm23* suppression of tumor metastasis."

P. Bryant, "*Drosophila* tumor suppressors and their human homologues."

Downstream kinases and phosphatases: J. Dixon, discussion leader

M. Cobb, "Extracellular signal-related kinases."

J. Wang, "Cell cycle phosphorylation on oncoproteins."

B. Neel, "Signal transduction by nontransmembrane tyrosine phosphatases."

J. Dixon, "Protein tyrosine phosphatases: Regulators of signal transduction."

R. Miesfeld, discussion leader

T. Pawson, "SH2 and SH3 domains in signal transduction."

L. Williams, "Signaling molecules that mediate the actions of PDGF and FGF."

Control of neoplasia through cell signaling pathways: L. Liotta, discussion leader

J. Gibbs, "Inhibition of *ras* processing."

G. Powis, "From bench to clinic: Signaling therapies for human tumors."

L. Liotta, "Signal transduction therapies for metastatic tumors."

Carbohydrates

Tilton School, Tilton, NH

B. Fraser-Reid, chair; O. Hindsgaul, vice chair

4–9 July

R. R. Schmidt, "New aspects of glycosylation reactions."

D. Tulshian, "Progress toward total synthesis of griscolic acid."

J. Leary, "Linkage position determination of metal coordinated oligosaccharides."

B. Meyer, "Theoretical and experimental studies on protein-carbohydrate interactions."

C. Lopez, "Serial radical–cyclization/intramolecular Diels-Alder strategies for functionalized decalins."

M. N. James, "Structural studies of the endoglycosidic mechanism of hen egg white lysozyme."

C. W. Andrews, "Transition states in glycoside hydrolysis."

G. Descotes, "Carbenes and nitrenes in carbohydrate chemistry."

A. Dondoni, "Can heterocycles be used in service to carbohydrate chemistry? Synthesis of sugars via thiazole intermediates."

W. Klaftke, "Steps toward the in vitro synthesis of deoxy sugars using enzymes from bacterial sources."

K. Tadano, "Recent progress in natural products synthesis featuring carbocyclizations of carbohydrate-derived substrates."

R. Hollingsworth, "Synthesis, structural, and computational aspects of bacterial lipopolysaccharides."

N. Nifant'ev, TBA

I. Tvaroska, "The role of intra- and intermolecular interactions in conformational analysis of carbohydrates."

D. Crans, "Vanadium A transition state analog for phosphatases?"

R. Madsen, "Novel pentenyloxy-based protecting groups."

J. Musser, "Sialyl Lewis X analogs as modulators of immuno-inflammatory processes."

B. Wolitzky, "Structural analysis of the interaction of E-selection with its carbohydrate ligand."

F. Gaeta, "A combined chemical and enzymatic approach to the synthesis of complex carbohydrates."

R. Roy, "Design, syntheses and immunochemical properties of tailor-made glycoconjugates."

F. Brewer, "Lectin carbohydrate cross-linking interactions."

T. Gallagher, "Nucleophilic building blocks for the synthesis of C glycosides."

B. Bendiak, "Sequential removal of monosaccharides from the reducing end of an oligosaccharide."

J. Chattopadhyaya, "Synthetic and conformational studies (500 and 600 MHz NMR) modeling the lariat intron formed in group II and nuclear mRNA splicing reaction."

Y. Nakahara, "Stereocontrolled synthesis of *O*-glycopeptides."

D. Mootoo, "Synthetic strategies based on the chemistry of 4-alkenyl acetals."

J. M. Beau, "Glycosylated enediyne antibiotics: Synthesis of model substances from carbohydrates."

B. Imperiali, "Recent studies on asparagine-linked glycosylation."

S. van Boeckel, "Some aspects of glycosamino-glycan chemistry."

M. D. Bednarski, "The synthesis of carbohydrate molecules that specifically bind to the human immunodeficiency virus (HIV-1 and HIV-2): New potential therapeutics for AIDS."

E. J. Toone, "Thermodynamics of protein-carbohydrate interactions: Clues for drug design."

M. Pinto, "Recent advances in glycosidation methodology."

C-H. Wong, "Carbohydrate enzymes for synthesis and inhibition: A chemo-enzymatic approach."

Catalysis

Colby-Sawyer College, New London, NH

K. C. Taylor, chair; G. B. McVicker, vice chair

27 June–2 July

H. Knozinger, "Structural and catalytic characteristics of promoted Rh/silica catalysts."

J. L. Robbins, "Bifunctional CO hydrogenation pathways on supported Pt."

B. Notari, "Titanium silicalite."

R. A. van Santen, "Theory of surface-chemical reactivity."

T. W. Root, "Wideline NMR studies of catalysts and adsorbates."

R. Y. Yang, "Electron microscopy studies of gas-carbon reactions."

P. C. Stair, "The adsorption of methyl radicals and the surface chemistry methyl groups."

B. C. Gates, "Ir and Pt clusters on oxide and zeolite supports: Synthesis, structure, catalysis."

S. T. Oyama, "Solid-state chemistry of metal carbides and nitrides."

M. Che, "Interface coordionation chemistry and ion-support interactions: Implications and applications in catalysis phenomena."

H. J. Robota, "Distinguishing between activity promotion through physical and chemical mechanisms by CeO_2 in three-way automotive catalysts under practical use conditions."

M. Shelef, "Challenge of selective catalytic reduction of NO_x with N-free reductants."

M. A. Anderson, "The use of porous ceramic materials in the photocatalytic remediation of impaired air and waters."

M-J. Ledoux, "Location and structure of the active catalytic sites in promoted sulfide catalysts based on molybdenum."

C. Friend, "Mechanism of heterogeneous reactions: Heteroatom addition and removal."

Catecholamines

Proctor Academy, Andover, NH

M. Zigmond, chair; I. Creese, vice chair

25–30 July

P. Goldman-Rakic, session chair

Three views of catecholamine interactions: K. Fuxe, discussion leader

P. Groves, "Anatomical and electrophysiological views."

M. Wightman, "An electrochemical view."

B. Westerink, "Insights from microdialysis and behavior."

S. Landis, session chair

Developmental plasticity in catecholaminergic systems: K. Unsiker, discussion leader

D. Chikaraishi, "Determinants of gene expression."

R. Lindsey, "Trophic factors in development and regeneration."

W. Dixon, session chair

Determinants of catecholamine release: L. Stjärne, discussion leader

R. Perlman, "Ca^{2+}-dependent release."

A. Wakade, "Ca^{2+}-independent release."

T. Westfall, "Influence of auto- and hetero-receptors."

M. Caron, session chair

Tolerance and sensitization: Molecule to behavior: J. Stewart, discussion leader

R. Lefkowitz, "The molecular basis of receptor changes."

T. Robinson, "The neurobiology of tolerance and sensitization."

R. Fuller, session chair

Dick Heikkila memorial: Catecholamines and neurotoxicity: R. Duvoisin, discussion leader

G. Cohen, "Dopamine, quinones, and free radicals."

P. Sonsalla, "Mechanism of action of methamphetamine."

A. Giovanni, "Is dopamine ever neurotoxic?"

C. Rutledge, session chair

Tyrosine hydroxylase regulation: R. Vulliet, discussion leader

W. Tank, "Regulation of tyrosine hydroxylase transcription."

J. Waymire, "Regulation of tyrosine hydroxylase activation."

S. Watson, session chair

Catecholamine transporters: Characterization and significance: M. Kuhar, discussion leader

S. Amara, "Structure of the catecholamine transporters."

B. Hoffman, "Transporters and drug action."

S. Tejani-Butt, "Regulation of catecholamine transporters."

H. Thoenen, "From knocking out neurons to knocking out genes."

J. Walters, session chair

What do catecholamines do, anyway?: D. Weinberger, discussion leader

J. Surmeier, "Catecholamines and membrane properties."

E. Nestler, "Catecholamines and second messenger systems."

B. Waterhouse, "Catecholamines and responsiveness to neuronal input."

Cell Contact and Adhesion

Proctor Academy, Andover, NH

L. F. Reichardt, chair; M. Hemler, vice chair

27 June–2 July

Integrins and intercellular signaling: M. Hemler, discussion leader

F. Maxfield, "Integrin signaling."

J. Brugge, "Adhesion-regulated cell signaling."

Z. Werb, "Regulation by cell contact and adhesion of gene expression."

Development 1: P. Wassarman, discussion leader

J. White, "The sperm receptor."

M. Nasrallah, "Cell-cell communication in plants."

P. Eckblum, "Kidney development."

R. Kagan, "Cell determination in the *Drosophila* retina."

Development 2: C. Buck, discussion leader

J. Sanes, "Novel approaches to utilizing retroviruses to study integrin function in individual cells."

M. Bronner-Fraser, "Strategies for determining adhesion molecule function in development."

D. McClay, "The role of cell adhesion in the development of echinoderms."

M. Schachner, "Cell adhesion molecules and extracellular matrix molecules in the nervous system."

Proteoglycans and other molecules involved in cell contact: M. Bernfield, discussion leader

R. Sheller, "Agrin."

S. Shaw, "Mechanisms by which CD-44 mediates growth factor actions."

D. Goodenough, "Gap junction structure, regulation, and function."

Genetic approaches to analyzing functions of cell contact and adhesion: R. Hynes, discussion leader

S. Gettner, "Genetic analysis of integrin function in *C. elegans*."

C. Kintern, "Novel approaches to studying the functions of cadherins in early development."

TBA

Regulation of adhesion molecule function: U. Rutishauser, discussion leader

TBA

T. Springer, "Cross talk between adhesive systems and regulating lymphocyte function."

M. Takeichi, "Regulation of cadherins and their functions in development."

Pathology and cancer: R. Isberg, discussion leader

L. Laskey, "Lymphocyte interactions with the vasculature."

P. Herrlich, "Molecular functions of CD-44 splice variants."

R. Isberg, "Intracellular growth of *Legionella pneumophila*."

Intracellular interactions and motility: A. F. Horwitz, discussion leader

D. Goldberg, "Cellular and biochemical responses of growth cones to ECM."

M. Sheetz, "The behavior of membrane proteins and implications for cell motility."

K. Campbell, "Dystroglycan, a novel laminin-binding protein and its role in muscular dystrophy."

Signaling mediated by cell contact: F. Walsh, discussion leader

TBA

S. Kater, "Signaling mediated by inhibitors and promoters of axon growth."

Solid State Studies in Ceramics

Colby-Sawyer College, New London, NH

R. M. Cannon, chair, D. J. Green, vice chair

15–20 August

Interface thermodynamics: R. Raj, discussion leader

J. W. Cahn, "Thermodynamics of junctions and wetting."

TBA, Multilayer adsorption and interparticle forces."

Oxide interfaces: S. Baik, discussion leader

R. W. Grimes, "Simulation of surfaces for oxides."

Y-M. Chiang, "Space charge at boundaries in ceramics."

Interface forces and bonding: A. Tomsia, discussion leader

T. Mikalske, "Interface forces with adsorbed layers."

Interface evolution: W. C. Carter, discussion leader

J. E. Taylor, "Mathematical analysis of surface morphologies."

Films at grain boundaries: T. W. Shaw, discussion leader

D. R. Clarke, "Stability of intergranular films."

M. Rühle, "Structure and composition of grain boundaries."

Particle interactions and rheology: K. Kendall, discussion leader

J. N. Israelachvili, "Measurement of interface forces."

B. Rand, "Particle-particle interactions and rheology."

Mechanical properties: I-W. Chen, discussion leader

D. S. Wilkinson, "Role of grain boundary glass on creep."

R. J. Kerans, "Effects of fiber interfaces on composites."

R. M. Cannon, discussion leader

TBA

Electronic materials: A. H. Heuer, discussion leader

A. D. Westwood, "Inversion domain boundaries."

F. Greuter, "Electrical properties of grain boundaries."

Chemical Oceanography

Kimball Union Academy, Meriden, NH

P. Froelich, chair; G. Luther, vice chair

15–20 August

Trace element bioavailability: G. Luther, discussion leader

J. H. Martin, "Status and plans for ocean iron theory."

K. Bruland, "Chemistry of iron in remote oceanic regions."

N. Price, "Iron and grazing control of NO_3 use in the EQPAC."

Volatile sulfur: Ocean, atmosphere, and ice cores: G. Cutter, discussion leader

M. O. Andreae, "Ocean-atmosphere exchange in sulfur cycle: Recent developments."

E. Saltzman, "Ice core records of paleoatmospheric sulfur."

Upper ocean fluxes—EQPAC: M. Leinen, discussion leader

J. Murray, "Export production in the equatorial Pacific."

R. Barber, "Physical forcing of primary production—JGOFS EQPAC."

R. Feely, "CO_2 exchange in the equatorial Pacific—history of El Niño effects."

Bottom ocean fluxes—EQPAC: M. Bacon, discussion leader

W. Berelson, "EQPAC benthic fluxes: Sea floor carbon cycling."

M. Leinen, "EQPAC biogenic fluxes during the Pleistocene: Controls on production, export, and regeneration of carbon."

Continental margin fluxes: M. Kastner, discussion leader

M. Arthur, "Submersible transects of phosphate muds, sands, and pavements: Peru margin."

R. Jahnke, "Sediment-water interface processes and benthic fluxes: Peru margin."

C. H. van der Weijden, "Organic carbon decomposition in the Arabian Sea."

Atmosphere-ocean transfer of fossil fuel CO_2: R. Keeling and T. Takahashi, discussion leaders

P. Quay, "^{13}C and the fate CO_2: Constraint or not?"

T. Sowers, "O_2/N_2 and CO_2 variations in the firm air from VOSTOK: Carbon implications over the last two decades."

R. Keeling, "Continuing high precision measurements of atmospheric O_2."

J. Sarmiento, "Global carbon cycle and anthropogenic perturbation."

E. Boyle, discussion leader

W. Broecker, "Stratagems for finding fossil-fuel CO_2 hidden in the ocean."

Paleocean chemistry: B. Anderson, discussion leader

R. Francois, "Late Quaternary carbon fluxes from sediment ^{230}Th, ^{231}Pa, and $\delta^{15}N$ profiling."

E. Boyle, "Has deep water formed in the north Pacific any time in the last 18,000 years?"

Molecular Biology of Ciliated Protozoa

New England College, Henniker, NH

D. Allis, R. Hallberg, co-chairs; K. Karrer, vice chair

11–16 July

Cell transformation: M-C. Yao, discussion leader

M-C. Yao, "RNA polymerase II gene expression in the rDNA vector."

J. Gaertig, "Mass transformation of *Tetrahymena* by electroporation of conjugants."

Telomere structure and synthesis: E. Blackburn, discussion leader

G. Fang, "*Oxytricha* telomere-binding protein promotes folding of telomeric DNA into G-quartet structures."

C. Price, "Telomere binding proteins and de novo telomere synthesis in *Euplotes*."

Genome rearrangement: C. Jahn, discussion leader

C. Jahn, "Transpon elimination in *Euplotes crassus*."

L. Klobutcher, "Heteroduplex circle junctions and the mechanism of IES excision in *Euplotes crassus*."

M-C. Yao, "Cis-acting sequence analysis for DNA rearrangement in *Tetrahymena*."

Cell surface proteins and cell-cell interactions: J. Preer, discussion leader

J. Forney, "Structure and expression of *Paramecium* variable surface protein genes."

K. Heckman, "The pheromones and the pheromone genes of *Euplotes*."

DNA replication: D. Larson, discussion leader

D. Larson, "Regulation of rDNA replication in *Tetrahymena*."

B. Polisky, "Rescue of cytoplasmic mutation d48 by DNA microinjection."

D. Olins, "The replication band of hypotrichs."

Development and differentiation: P. Bruns, discussion leader

P. Bruns, "Mutational approach to studying conjugation in *Tetrahymena*."

E. Orias, "Mating type determination in *Tetrahymena* thermophila: A developmental program, heritable differentiation of macronucleous."

Genome structure and expression I: M. Gorovsky, discussion leader

M. Gorovsky, "The role of a histone H2A variant in gene expression."

D. Allis, "Linker histone phosphorylation: New tools–new insights."

Genome structure and expression II: J. Engberg, discussion leader

K. Karrer, "A conserved amino acid motif in the propeptide region of cysteine proteases."

R. Hallberg, "Heat-inducible scRNAs."

Signal transduction: C. Kung, discussion leader

C. Kung, "Molecular biology of the excitable membrane."

R. Hinrichsen, "Calmodulin and behavior in *Paramecium*."

J. Schultz, "The cilia of *Paramecium* as sensory organelles."

Chronobiology

Colby-Sawyer College, New London, NH

W. J. Schwartz, chair; S. Daan, vice chair

8–13 August

Transcriptional and translational mechanisms I: M. Rosbash, discussion leader

T. Kondo, "Prokaryotic circadian rhythms of gene expression reported by bacteria luciferase."

M. Mittag, "Circadian control of gene expression in the bioluminescence system of the marine dinoflagellate *Gonylaulax polyedra*."

J. Kornhauser, "Light-activated signal transduction pathways in the suprachiasmatic nucleus."

Transcriptional and translational mechanisms II: M. Young, discussion leader

D. Bell-Pedersen, "*Neurospora*—the molecular identity of a clock gear and hand."

J. Hall, "Elements of the period gene's cyclical expression in the *Drosophila* brain."

R. van Gelder, "Circadian control of gene transcription in *Drosophila melanogaster*."

Clocks in culture: A. Eskin, discussion leader

G. Cahill, "A circadian oscillator in vertebrate retinal photoreceptors."

G. Block, "Cellular analysis of circadian rhythms in isolated neurons."

D. Earnest, "Establishment, characterization, and subcloning of immortalized cell lines derived from the rat suprachiasmatic nucleus."

Unfamiliar clocks: J. W. Hastings, discussion leader

J. Giebultowicz, "Circadian pacemaker in insect testis controls release and maturation of sperm."

D. Liu, "Mutations affecting periodic behavior in *C. elegans*."

Clocks in situ—input mechanisms: S. Daan, discussion leader

T. Roenneberg, "Living with two clocks."

D. Janik, "Mechanisms of non-photic phase shifting."

C. Czeisler, "Mechanisms of entrainment of the human circadian pacemaker."

Clocks in situ—output mechanisms: F. Turek, discussion leader

R. Silver, "What do suprachiasmatic nucleus grafts really do?"

G. R. Lynch, "The suprachiasmatic nucleus in vitro, melatonin, and seasonal behavior in the djungarian hamster."

Suprachiasmatic nucleus—new tools: M. Gillette, discussion leader

P. Wise, "Use of antisense nucleotides to study the circadian clock."

M. Hastings, "Functional domains of the suprachiasmatic nucleus."

A. van den Pol, "Digital imaging of cellular behavior in the suprachiasmatic nucleus."

Photoperiodic mechanisms: S. Reppert, discussion leader

R. Hardeland, "Photoperiodism at the cellular level: Rhythms and effects of indoleamines in *Gonyaulax* polyedra."

T. Lee, "Communication of photorefractoriness from mother to pups."

Temperature and timekeeping: I. Zucker, discussion leader

D. Grahn, "Circadian rhythmicity in hibernating ground squirrels."

M. Gerkema, "Temperature relationships in ultradian rhythms."

M. Zatz, "Thermal effects on melatonin rhythms in chick pineal cells."

Daily commentaries by: J. Feldman, M. Menaker, R. Y. Moore, C. S. Pittendrigh.

Coastal Ocean Circulation

Plymouth State College, Plymouth, NH

M. Bowman, chair; C. Mooers, vice chair

13–18 June

Wind-driven shelves: D. Haidvogel, discussion leader

K. Brink, "Short-scale current variations over the continental shelf."

S. Lentz, "Surface and bottom boundary layers on the continental shelf."

J. Allen, "Across-shelf flow: Modeling and observation."

Tidally dominated shelves: D. Haidvogel, discussion leader

J. Simpson, "The North Sea project: An intensive study of a tidally driven shelf sea."

J. Loder, "Circulation and hydrographic structure in the Georges Bank region."

Buoyancy driven shelves: C. Winant, discussion leader

W. Boicourt, "Estuarine plumes."

D-P. Wang, "Frontal instabilities."

D. Chapman, "Large-scale effects of fresh water inflows on continental shelves."

Coastal air/sea interaction: C. Winant, discussion leader

J. Overland, "Synoptic and trapped disturbances in the coastal atmosphere: Forcing of coastal circulation."

J. Bane, "Strong air-sea interactions: The Gulf Stream in winter."

Shelf/open ocean interaction: J. Allen, discussion leader

D. Haidvogel, "Numerical simulation of cross-shelf exchange in the California current system."

J. Huthnance, "Shelf-open ocean interaction: Fluxes and large-scale controls."

R. Beardsley, "Tidal phenomena on the Amazon shelf."

Inner shelf circulation: J. Allen, discussion leader

T. Bowen, "Circulation on the inner shelf: A little of everything with a large dose of waves."

R. Holman, "Near shore dynamics."

Large-scale coastal circulation: C. Mooers, discussion leader

R. Greatbatch, "The circulation on the Newfoundland/Labrador shelf."

K. Thompson, "Scotian shelf circulation: Tackling the open boundary problems with data assimilation models."

D. Brooks, "Simulated and observed circulation in Gulf of Maine–Georges Bank region."

C. Mooers, discussion leader

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Mean flows, undercurrents, unstable jets: K. Brink, discussion leader

J. McCreary, "Dynamics of the circulations along the east and west coasts of India."

G. Holloway, "Statistical influence of eddy topography interaction on coastal circulation."

K. Brink, Summary.

Coatings and Films

Colby-Sawyer College, New London, NH

A. K. St. Clair, chair; C. E. Hoyle, vice chair

1–6 August

E. Glass, discussion leader

H. Hoffman, "Rheological properties of different viscoelastic surfactant solutions: Systems with and without a yield value."

R. Zana, "Microstructures in aqueous solutions of dimeric and polymeric amphiphiles."

D. Katsamberis, discussion leader

I. Harrison, "Polyethylene films for long duration balloons."

H. Hopfenberg, "Transport in stiff chain polymeric films and coatings: The next generation of barrier films and ultrapermeable membranes."

R. Brady, discussion leader

D. Williams, "Orientation and relaxation in second order nonlinear optical polymers."

J. Perry, "Recent developments in nonlinear optic and electro-optic polymer films."

D. Stoakley, discussion leader

G. George, "Chemiluminescence methods for studying the environmental performance of films and coatings."

D. Boyd, discussion leader

P. Cebe, "Electrical properties of semicrystalline high-performance polymers."

A. Balazs, "Theoretical models for polymer films: Predictions for controlling interfacial properties."

C. Brown, discussion leader

R. Farris, "Determination of stress state and adhesion in polymeric coatings."

J. Wightman, "Characterization of the molecular structure of the interphase in thin polymer films and in polymer coatings on metal substrates."

K. Thompson, discussion leader

S. Freilich, "Photoconductivity of polymer films."

J. Scheinbeim, "Electroactive polymer films—ferroelectric, piezoelectric and electrostrictive properties."

B. Benicewicz, "Conductive polymers as anticorrosion coatings."

G. Pilcher, discussion leader

A. Brown, "Stealth design of the F-117A fighter."

C. Hoyle, discussion leader

D. Schmidt, "High-performance water-based, anti-stick coating systems."

R. Eley, "Numerical simulation of coatings flows."

Condensed Matter Physics

Brewster Academy, Wolfeboro, NH

M. Kardar, chair; M. Weissman, vice chair

27 June–2 July

Randomly constituted polymers and gels

T. Tanaka, "Multiple phases of random polymer gels."

P. Goldbart, "Solidification via crosslinking—rubber as anamorphous solid."

Protein folding

E. Shakhnovich, "Statistical mechanics of random heteropolymers."

P. Wolynes, "Spin-glass aspects of protein folding."

Spin glasses: A. N. Berker, discussion leader

S. McKay, "Chaos in spin glasses: Renormalization group studies."

J. Cowen, TBA

Phase transitions in porous media

M. Chan, TBA

J. Machta, "Phase transitions in porous media with long-range correlations."

Vortex glass in superconductors: V. Vinokur, discussion leader

T. Hwa, "Scaling and rare fluctuations in randomly pinned flux lines."

M. Feigelman, "Distinctions and similarities of gauge, vortex, and spin glasses."

D. Bishop, "Statics and dynamics of vortices in oxide superconductors."

Charge density waves: R. Thorne, discussion leader

A. C. Marley IV, "New probes of metastable states in CDWs."

S. Coppersmith, TBA

Interface pinning in random media

O. Narayan, "The depinning transition for driven random interfaces."

M. O. Robbins, "Critical phenomena in interface motion through random media."

P. Z. Wong, "Roughness of wetting fluid invasion fronts in porous media."

Rough surfaces: J. Krim, discussion leader

R. Bruinsma, TBA

Disorder in the quantum regime: D. S. Fisher, discussion leader

M. P. A. Fisher, TBA

S. Sachdev, "Spin-fluid phases of random quantum magnets."

B. Simons, "Universalities in disordered and chaotic spectra."

Corrosion—Dry

Colby-Sawyer College, New London, NH

J. L. Smialek, chair; H. S. Isaacs, vice chair

18–23 July

Segregation phenomena in the oxidation of metals: N. S. Bornstein, discussion leader

P. Y. Hou, "Impurity segregation and the reactive element effect on scale adhesion."

G. J. Tatlock, P. Fox, "High resolution microanalysis of sulfur segregation in metals and oxides."

TEM studies of oxidation phenomena: S. B. Newcomb, discussion leader

M. Backhaus-Ricoult, "Identification of ceramic composite corrosion mechanisms by TEM."

M. Rühle, "TEM studies of the high-temperature oxidation of intermetallics."

^{18}O tracer studies and alumina scale growth mechanisms: F. H. Stott, discussion leader

D. Mitchell, "Imaging SIMS studies of ridged alumina scale growth on β-NiAl."

B. A. Pint, "Relationship between microstructure and growth mechanism of α-Al_2O_3 scales between 950° and 1500°C."

J. Jedlinski, "Application of tracer/SIMS techniques to the study of the oxidation mechanisms of alumina formers."

Oxidation and corrosion of ceramics: K. L. Luthra, discussion leader

L. Filipuzzi, "Oxidation modeling of Sic fiber–reinforced Sic composites."

D. W. Readey, "Gaseous active corrosion of ceramics."

Oxidation of TiAl intermetallics: M. J. Bennett, discussion leader

A. Rahmel, "Fundamentals of TiAl oxidation: What is known and what is not known."

Y. Shida, "The effect of additives on the oxidation behavior of TiAl."

Applied stresses and high-temperature oxidation: D. A. Shores, discussion leader

M. Schütze, "Interaction between stresses and oxidation for Ni and TiAl."

P. Hancock, "Influence of imposed strain rate on the fracture of oxide scales."

Diffusional aspects of nickel aluminum alloy oxidation: F. S. Pettit, discussion leader

J. A. Nesbitt, "Alloy diffusion and the breakdown of Al_2O_3 scales on NiAl."

H. J. Grabke, "Cavity and internal oxide formation in the oxidation of β-NiAl."

D. J. Young, B. Gleeson, "Alloy composition and diffusion effects in the oxidation of NiCrAl alloys."

Feigenbaum, Iyapunov, and other strange attractions: G. C. Wood, discussion leader

J. Stringer, "Chaotic corrosion."

Pest oxidation of intermetallic compounds: M. J. Maloney, discussion leader

G. H. Meier, "Oxidation behavior of $MoSi_2$ with emphasis on the intermediate temperature (400°–600°C) oxidation phenomena."

J. Doychak, "TEM analysis of intermediate temperature oxidation products of $MoSi_2$ and $NbAl_3$."

Developmental Biology

Proctor Academy, Andover, NH

E. F. Wieschaus, chair; J. C. Smith, vice chair

20–25 June

Signaling systems involving molecules secreted in the extracellular space: B. Hogan, discussion leader

J. Green, K. Anderson, J. Rossant, speakers

Short range signaling and equivalence groups: I. Greenwald, discussion leader

L. Zipursky, C. Kintner, speakers

Cell movement and migration: R. Beddington, discussion leader

R. Keller, F. Bonhoeffer, C. Ettensohn, C. Kenyon, speakers

What does wingless/wnt-1 protein do: H. Varmus, discussion leader

A. McMahon, G. Struhl, J. Christian, speakers

Muscle differentiation: H. Weintraub, discussion leader

M. Bate, H. Blau, J. Gurdon, M. Westerfield, speakers

Posttranscriptional control of maternal RNA: M. Wickens, discussion leader

D. Melton, R. Lehmann, S. Strickland, speakers

Down stream of transcription factors: S. Tilghman, discussion leader

B. Meyer, M. Levine, M. Scott, R. Krumlauf, speakers

Cell lineage and expression of homeodomain selector genes: P. Lawrence, discussion leader

A. Lumsden, W. Bender, J. Way, speakers

Evolution and redundant pathways in development: L. Wolpert, discussion leader

R. Raff, C. Nusslein-Volhard, R. Jaenisch, speakers

Drug Metabolism

Holderness School, Plymouth, NH

C. J. Parli, chair; T. A. Baillie, vice chair

11–16 July

The molecular biology and regulation of glucuronidation and sulfation: T. R. Tephly, discussion leader

P. Mackenzie, "Molecular and evolutionary aspects of UDP-glucuronosyltransferases."

M. D. Green, "Species differences in the structure and function of UDP-glucuronosyltransferases which catalyze the glucuronidation of common substrates."

C. Falany, "Human cytosolic phenol sulfotransferases."

Peroxisome proliferators, cytochromes P-450, and hepatoacarcinogenicity: S. H. Weinstein, discussion leader

R. T. Okita, "Peroxisime proliferators and cytochrome P-450–mediated reactions."

J. A. Popp, "Peroxisime proliferators and hepatocarcinogenicity."

Metabolism of agrochemicals: T. A. Baillie, discussion leader

E. Hodgson, "Monooxygenation of pesticides."

G. L. Lamoureux, "Current trends in plant herbicide metabolism research."

D. H. Hutson, "Conjugation reactions: The significance of the mundane, the unusual and the exotic."

Non-mammalian models in drug metabolism: M. O. James, discussion leader

J. J. Stegeman, "Species similarities and differences in cytochrome P-450 forms, function, and regulation: The validity of extrapolation between species."

M. O. James, "Understanding phase II metabolism in non-mammalian species can facilitate the interpretation of species differences in toxicological responses."

The use of in vitro metabolism studies in the understanding of new drugs: S. H. L. Chiu, discussion leader

R. Borchardt, "The use of cultured intestinal epithelial (Caco-2) cells to study drug transport and metabolism."

S. Spielberg, "Characterization of heterogeneity in reactive drug metabolite detoxification using readily obtained human cells."

Y. Sugiyama, "Prediction of in vivo drug metabolism from in vitro data based on physiological pharmacokinetic modeling."

Novel reaction mechanisms: J. M. Mathews, discussion leader

H. T. Nagasawa, "Oxidation of xenobiotics to nitroxyl (HN=O)–generating intermediates."

J. D. de Bethizy, "*N*-glucuronidation: A novel pathway for nicotine metabolism."

Metabolically defined and genetically engineered cell lines as tools to elucidate drug metabolism: D. W. Roberts, discussion leader

F. J. Gonzalez, "cDNA-directed expression of human P-450s: Use in drug development and safety assessment."

J. Doehmer, "Genetically engineered V-79 Chinese hamster cells stably expressing cytochrome P-450s: Applications in drug metabolism and toxicity studies."

J. E. Snawder, "Cytochrome P-450–dependent metabolism and cytotoxicity of acetaminophen in HepG2 cells and four human transgenic lymphoblastoid cell lines."

M. S. Tempesta, "Pharmacognosy in the 90's."

Evolving bioanalytical techniques in drug metabolism: L. J. Klunk, discussion leader

I. A. Blair, "Chemical reaction interface mass spectrometry: An alternative to radioisotopes for studies in drug metabolism."

M. A. Moseley, "Applications of CZE and CZE-MS in drug metabolism."

Dynamics of Gas-Surface Interactions

Proctor Academy, Andover, NH

H. Metiu, chair; R. Cavanagh, vice chair

1–6 August

J. Yates, discussion leader

A. Kleyn, "Time-resolved IR spectroscopy of zeolites."

S. Ceyer, "Dynamics of hydrogen absorption into nickel and the chemistry of bulk hydrogen."

TBA, discussion leader

C. Rettner, "Quantum site–specific dynamics of the dissociation of hydrogen on Cu(111)."

J. Tully, discussion leader

S. Sibener, "Molecular beam studies of surface dynamics."

E. Carter, "First principles derived dynamics of chemical processes on Si(100)."

TBA, discussion leader

M. Head-Gordon, "Non-adiabatic interactions between molecules and metal surfaces."

M. Lagally, discussion leader

G. McClleland, "Observing a single adsorbed atom with picosecond and subnanometer resolution."

P. Avouris, "STM induced modifications and electrical properties of surfaces on an atomic scale."

G. Comsa, discussion leader

T. Michely, "Surface morphology during homepitaxial growth."

TBA, discussion leader

R. Hochstrasser, "Ultrafast vibrational processes in condensed phases on surfaces: Contrasts and similarities."

J. Stephenson, "Ultrafast laser studies of energy flow: Adsorbate vibrations, lattice phonons, and hot electrons."

E. Hasselbrink, "Photochemistry on metal surfaces."

TBA, discussion leader

J. Trautman, "Near-field optics of surfaces."

TBA, discussion leader

A. Vlieg, "X-ray diffraction studies of surface dynamics."

P. Estrup, "Effect of surface structure change on kinetics: Hydrogen on metal."

R. Haight, "Semiconductor surface electron dynamics studies subpicosecond photoemission."

Dynamics of Simple Systems

Proctor Academy, Andover, NH

J. L. Friar, chair; R. S. Berry, vice chair

15–20 August

J. de Swart, "Nucleon-nucleon partial-wave analyses and nucleon-nucleon potentials."

S. Wallace, "Relativistic bound states and form factors: The quasipotential approach."

J. Carlson, "Monte Carlo approaches to structure and dynamics in light nuclei."

L. Knutson, "Few-nucleon experiments at low energies."

N. Rodning, "Multi-nucleon photoemission measurements using a large acceptance detector."

F. Gross, "Recent progress in the relativistic few-body problem."

D. Lehman, "Continuum Faddeev calculations and electromagnetic interactions."

A. Picklesimer, "A few deltas in a few few-nucleon systems."

G. Hale, "R-matrix methods for studying nuclear effects in muon-catalyzed fusion."

D. Campbell, "Complexity in simple systems."

A. Bulgac, "Random matrices and interactions between slow and fast degrees of freedom."

J. Cina, "Large-amplitude nuclear motion and electronic response."

J. Doering, "(e.3e) experiments to probe electron correlations in atoms."

M. Dunn, "Higher angular momentum states in D dimensions."

G. Ezra, "Semiclassical aspects of few-body Coulomb systems."

W. Johnson, "Diagonalizing the No-pair Hamiltonian for the He isoelectronic sequence."

M. Kellman, "Dynamical analysis of highly excited molecular vibrational spectra."

A. Pines, "Spin dynamics and geometry."

J. Shertzer, "Finite element analysis of two-electron systems."

K. Rademann, "Electronic interactions in small clusters of atoms: Nonmetal-to-metal transitions in mercury, cadmium, and zinc."

M. Gutzwiller, TBA

J-M. Rost, "A non-perturbative approach to multiple fragmentation of few-body systems."

Elastin

Kimball Union Academy, Meriden, NH

R. Senior, chair; C. Boyd, vice chair

8–13 August

Tropoelastin gene: Structure and evolution: C. Boyd, discussion leader

C. Boyd, "Tropoelastin gene: An overview."

J. Schwarzbauer, "A lesson in structure: Function relationships from analysis of the fibronectin gene."

F. Keeley, "Lamprin: An elastic protein in invertebrates."

Regulation of elastin production: W. Parks, discussion leader

W. Parks, "Developmental regulation of elastin production."

R. Pierce, "Posttranscriptional control of tropoelastin expression."

J. Uitto, "Elastin regulation in transgenic mice."

J. Foster, "IGF-1 responsive elements in the tropoelastin gene."

Microfibrils: L. Sakai, discussion leader

L. Sakai, "Structure and assembly of microfibrils."

G. Corson, "Sequence analysis of functional domains in fibrillin."

F. Ramirez, "Structure and expression of fibrillins."

M. Gibson, "Cloning of a new fibrillin-like protein (FLP)."

Molecular pathology of the elastin-associated microfibril: H. Dietz, discussion leader

L. Peltonen, "One class of marfan mutations: Truncated fibrillin polypeptide chains."

U. Franke, "Genotype-phenotype correlations of fibrillin mutations."

H. Furthmayr, "Biosynthesis and processing of defective fibrillin in marfan syndrome."

H. Dietz, "Pathobiology of Marfan syndrome: Early lessons from genotype assessment."

Elastic fiber assembly: R. Mecham, discussion leader

E. Cleary, "Proteoglycans in elastic fiber assembly."

G. Bressan, "Identification of a gp 115–enriched domain within elastic fibers."

L. Robert, M. P. Jacob, "The elastin receptor, its transmission pathway, and role in physiology and pathological cell functions."

Lysyl oxidase: H. Kagan, discussion leader

H. Kagan, "Substrate specificity and catalytic mechanism of lysyl oxidase."

R. Friedman, "Characterization and Ras suppressor function of the mouse lysyl oxidase gene."

P. Trackman, "Regulation of lysyl oxidase expression."

Elastin Turnover: R. Senior, discussion leader

H. Chapman, "Regulation of cathepsin S expression by human monocytes/macrophages."

E. Campbell, "The clinical spectrum of α 1-antitrypsin deficiency."

J. Brown, "Structural requirements for secretion of α 1-antitrypsin."

M. Glass, "Biochemical markers of proteolysis in controlled clinical trials."

J. Rosenbloom, discussion leader

Pathobiology of elastic tissue: Failed repression of elastase elastin and cell proliferation: M. Rabinovitch, discussion leader

M. Rabinovitch, "Failed repression on vascular elastase: Impact on cellular and molecular mechanisms."

R. Rosenberg, "Filed repression of vascular smooth muscle cell proliferation: Deregulation of proto-oncogenes and antisense therapy."

A. Hinek, "The elastin binding 'companion' protein as a regulator and deregulator of vascular extracellular matrix production and assembly."

B. Starcher, "Lessons from genetic strains of mice on the regulation of elas-

tin and elastase in wound repair and lung disease."

Elastomers, Networks, and Gels

Salve Regina University, Newport, RI

B. Günesin, chair; R. Quirk, vice chair

18–23 July

D. N. Schulz, discussion leader

J. Koberstein, "Phase behaviour of block copolymer, homopolymer blends."

R. Statler, "The glass transition of elastomer in special confinement."

J. H. Lyngae-Jorgenson, "Structure/phase transitions during shear flow in block copolymers."

E. Kresge, discussion leader

H. Brown, "Chain pull out effects on adhesion of elastomers."

H. Finkelmann, "Mechanical, electromechanical effects of liquid crystal elastomers."

J. Puskas, discussion leader

S. Patta, "Functionalized ethylene-propylene elastomers synthesis and uses."

G. Kaszas, "Structure property correlations of polyisobutylene-polystyrene block copolymers."

J. Dias, "New graft copolymers of polyisobutylene and poly(methylstyrene)."

L. Gilliom, discussion leader

I. Yilgör, "Novel polyurethaneurea elastomers."

B. Novak, "Simultaneous interpenetrating organic/inorganic networks."

G. McKenna, discussion leader

O. Kramer, "What is gel?"

J. Bastide, "Effect of swelling, stretching on the fluctuations of polymer concentrations in gels."

R. Bruinsma, "Butterfly patterns in stressed gels and rubbers."

R. Stepto, discussion leader

V. Galiatsatos, "Optically transparent networks."

L. Garrido, "NMR imaging of polysiloxane elastomers."

B. Eichenger, discussion leader

B. Erman, "Entanglements in amorphous networks."

L. Bokobza, "Segmented orientation in model networks of PDMS Fourier transform infrared dichoism measurements."

H. Siesler, "Rheo-optical vibrational spectroscopy of polymer networks."

B. Günesin, discussion leader

R. Stein, "Recycling elastomers/polymers."

R. Quirk, discussion leader

D. Parker, "Degradation of bisphenol-cured fluoroelastomers."

G. Dhaliwal, "Mechanistic curing study of elastomers using model curatives."

C. Bucknall, M. Kozlowski, "Rubber toughened plastics: Solid state and rheological behaviour."

Enzymes, Coenzymes, and Metabolic Pathways

Kimball Union Academy, Meriden, NH

P. Cook, M-D. Tsai, co-chairs

18–23 July

Protein engineering: J. Villafranca, discussion leader

A. R. Fersht, "Folding pathway of barnase."

J. F. Kirsch, "New insights into enzyme design and mechanism from genetic engineering of aspartate aminotransferase."

S. Benner, "Prediction of the conformation of polypeptide chains."

Metabolic pathways: B. Liu, discussion leader

R. K. Thauer, "A novel type of hydrogenase without iron-sulfur clusters in methanogenic archaea."

L. Katz, "The erythromycin polyketide synthase."

R. Tabita, "Regulation of synthesis, assembly, and catalysis of ribulose 1,5-bisphosphate carboxylase/oxygenase (RubisCO)."

Enzyme mechanism I: D. Kiick, discussion leader

C. B. Grissom, "Magnetic spin effects in radical enzymatic reactions."

M. L. Sinnott, "Catalysis by neuraminidases."

J. S. Blanchard, "Chemical mechanisms of reactions catalyzed by flavoprotein reductases."

F. Raushel, TBA

Coenzymes: R. Armstrong, discussion leader

P. Frey, "The cofactors of lysine 2,3-aminomutase."

B-M. Sjoberg, "Protein engineering studies in the vicinity of the tyrosyl radical–iron center site of ribonucleotide reductase."

TBA

Enzyme mechanism II: V. Anderson, discussion leader

R. Yount, I. Rayment, "Structure and mechanism of myosin."

H. Floss, "Tritium NMR in enzyme stereochemistry studies."

D. Dunaway-Mariano, "Novel enzymic hydrolytic dehalogenation of a chlorinated aromatic."

G. Reinhart, "The nature of allosteric interactions."

Enzyme mechanism III: T. Meek, discussion leader

D. Herschlag, "The catalytic mechanisms of a ribozyme derived from a group I self-splicing RNA."

R. Dunlap, "Lazarus inhibitors of human leukocyte elastase."

R. Hille, "Mechanistic studies of xanthine oxidase."

Interfacial catalysis: M. Gelb, discussion leader

H. M. Verheij, "Phospholipase A2: Inhibition and protein engineering. What did we learn from it?"

M. K. Jain, "The kinetic basis for interfacial catalysis."

B. Rubin, "How neutral lipases are turned on: Action at the interface."

G. Nelsestuen, "Interaction of protein kinase C with membranes and its activation properties."

D. J. Hope, discussion leader

G. Petsko, "Cobs, knobs, and blobs."

H. K. Schachman, "Aspartate transcarbamoylase."

Phosphoryl transfer enzymes: D. Silverman, discussion leader

W. W. Cleland, "Separation and determination of the absolute configurations of the isomers of monoamminechromium ATP."

D. C. Crans, "Vanadate derivatives as inhibitors, substrates, and cofactors."

B. Ray, "How phosphoglucomutase conducts its business: Structure/function correlations."

Epitaxial Thin Films and Interfaces

Colby-Sawyer College, New London, NH

R. Hull, chair; J. M. Gibson, vice chair

25–30 July

Equilibrium and non-equilibrium thermodynamics of epitaxial crystal growth: J. A. Venables, discussion leader

A. Zangwill, "Theoretical models of epitaxial growth morphology."

B. Orr, "Morphological evolution of epitaxial films."

Epitaxial growth modes: D. J. Eaglesham, discussion leader

J. H. Van der Merwe, "Growth modes in epitaxy."

H. J. Osten, "Surfactants in epitaxial growth."

Misfit dislocations in strained films: W. A. Jesser, discussion leader

R. Bullough, "What do we mean by critical thickness?"

K. Maeda, "The microscopic mechanism of dislocation glide in semiconductor thin films."

W. Schroter, "Electrical properties of dislocations."

Materials issues in epitaxial devices: G. A. Rozgonyi, discussion leader

J. Sturm, "Materials issues in Si-based devices."

H. Temkin, "Materials issues in optoelectronic devices."

Atomic scale control of dopants and point defects: L. C. Feldman, discussion leader

H. J. Gossman, "Delta-doped structures in Si and dopant-defect interactions."

S. M. Hu, "Diffusion across heterostructures."

Prospects for realistic simulation of epitaxial growth and defects: J. Tersoff, discussion leader

D. Srivastava, "Prospects for molecular dynamics simulations of epitaxial growth."

R. Jones, "Structure and properties of dislocations in semiconductors."

In situ probes of epitaxial growth: D. K. Biegelsen, discussion leader

M. Pashley, "In situ STM studies of epitaxial growth."

R. M. Tromp, "In situ LEEM studies of crystal growth."

P. H. Fuoss, "In situ x-ray observations of epitaxial growth."

Materials science without a laboratory: E. Weber, discussion leader

R. Martin and D. DeFontaine, speakers

Late news and summary: R. Hull and M. Gibson, discussion leaders

Epithelial Differentiation and Keratinization

Tilton School, Tilton, NH

J. G. Rheinwald, chair; T-T. Sun, vice chair

1–6 August

Gene regulation in the epidermis and during development: K. Holbrook, discussion leader

B. Hogan, "TGFβ-related genes in hair development."

E. Fuchs, "Epidermal differentiation and human skin disorders."

H. Green, "Structural and regulatory genes of keratinocytes."

The biology of internal epithelia: T-T. Sun, discussion leader

B. Dale, "Oral epithelial keratinization and profilaggrin expression."

L. Reid, "Matrix and hormonal modulation of liver stem cells."

Epithelial growth regulation and neoplasia: S. Yuspa, discussion leader

S. Aaronson, "Paracrine growth factors for epithelial cells."

P. Herrlich, "Cross coupling of transcription factors controlling growth versus differentiation."

R. Schlegel, "Papillomavirus proteins that modulate keratinocyte growth."

Models of epithelial growth and function: L. Taichman, G. Rogers, discussion leaders

The immunobiology of skin: T. Kupper, discussion leader

T. Kupper, "The role of the epidermis in inflammation and immunity."

R. Tigelaar, "Immunobiology of intraepidermal γδ T cells."

R. Modlin, "T cell and cytokine patterns in skin disease."

Retinoid regulation of epithelial differentiation: J. Voorhees, discussion leader

L. Gudas, "Gene regulation by retinoids in epithelial differentiation."

P. Kastner, "Disruption of genes encoding retinoic acid receptors and binding proteins in the mouse."

Cell-cell adhesion molecules and structures: K. Green, discussion leader

W. Carter, "Cell adhesion in epidermal morphogenesis."

J. Stanley, "Autoantibodies against adhesion molecules in pemphigus."

W. Franke, "The desmosome-intermediate filament complex in epidermal differentiation."

Molecular basis of keratinization and cornification: D. Roop and J. Compton, discussion leaders

The epidermal/connective tissue junction: F. Watt, discussion leader

J. Uitto, "Cloning of cutaneous basement membrane zone genes."

R. Burgeson, "Two laminin isotypes involved in epithelial-stromal adhesion."

Extrachromosomal Elements: Plasmid and Chromosome Dynamics

Plymouth State College, Plymouth, NH

J. Broach, chair; D. Helsinki, vice chair

4–9 July

Chromosome structure

Structure of yeast telomeres: G. Zakian, discussion leader

J. Swedlow, "Three dimensional organization of *Drosophila*."

L. Clark, "*S. pombe* centromere structure and function."

D. Pettijohn, "Targeting of DNA binding proteins in bacterial chromosomes."

DNA replication—plasmids and viruses

Replication of *S. aureus* plasmids: R. Novick, discussion leader

D. Helsinki, "Mechanism of replication of broad host-range plasmids."

J. Hurwitz, "SV40 DNA replication."

M. Botchan, "Replication and partitioning of bovine papilloma viruses."

DNA replication—chromosomes

Control of replication in *S. cerevisiae*: J. Campbell, discussion leader

D. Bastia, "Termination of eukaryotic DNA replication."

B. Brewer, "Timing of chromosomal DNA replication in yeast."

C. Greider, "Replication of mammalian telomeres."

Chromosome segregation

Genetic analysis of chromosome segregation in yeast: P. Hieter, discussion leader

T. Salmon, "Mitosis and microtubule dynamics."

M. Schmid, "The role of topoisomerases in segregation of the *E. coli*."

S. Hiraga, "Genes essential for chromosome partitioning in *E. coli*."

Mechanisms of segregation

The role of KAR3 in mitosis and karyogomy in yeast: M. Rose, discussion leader

D. Koshland, "Genetic and physical analysis of centromere function in yeast."

L. Goldstein, "Motors in mitosis."

T. Hyman, "Characterization of motor proteins in the kinetochore of yeast chromosomes."

Coupling chromosomal replication and segregation

Mechanism of partitioning of plasmid P1: S. Austin, discussion leader

T. Enoch, "Coupling mitosis to DNA replication in *S. pombe*."

N. Cozzarelli, "The role of supercoiling in plasmid and chromosome segregation in *E. coli*."

A. Hoyt, "Checkpoint control of spindle formation in yeast."

Coupling plasmid replication and segregation

Control of plasmid pS101 partitioning: S. Cohen, discussion leader

L. Caro, "pSC101 plasmid copy control."

R. D'ari, "*E. coli* chromosome segregation and DNA methylation."

K. Nordstrom, "Plasmid copy number control."

Transposons and transpositions

The mechanism of Ty transposition in yeast: J. Boeke, discussion leader

R. Plasterk, "Transposons in *C. elegans*."

T. Eickbush, "Transposition of *Bombyx* rDNA elements."

F. Perier, "Infectious introns in thermophiles."

Amplifications and rearrangements

Regulation of mating type interconversion in *S. cerevisiae*: J. Broach, discussion leader

A. Klar, "Mating type interconversion in *S. pombe*."

G. Wahl, "Eukaryotic DNA amplification."

J. Roth, "Chromosomal inversions and duplications in *E. coli*."

Fertilization and Activation of Development

Holderness School, Plymouth, NH

L. A. Jaffe, chair; G. S. Kopf, vice chair

15–20 August

Sperm interactions with the follicular environment and the zona pellucida: G. S. Kopf, discussion leader

S. Meizel, "Steroid initiated exocytosis in human sperm."

B. D. Shur, "Cell surface galactosyl transferase function during gamete recognition."

L. Silver, "Cloning and characterization of the sperm surface candidate egg-binding protein, sp56."

Sperm chemotaxis: R. L. Miller, discussion leader

L. J. Dangott, "Egg-peptide receptors on sea urchin spermatozoa."

M. Eisenbach, "Chemotaxis of human spermatozoa to a follicular factor."

Sperm interactions with the egg plasma membrane: M. Gould, discussion leader

D. Myles, "Mammalian sperm-egg fusion."

Y. Iwao, "The mechanism of Ca^{2+} recruitment in the activation of *Xenopus* eggs by a sperm extract."

K. Foltz, "Structure-function analysis of the sea urchin sperm receptor."

Egg activation mechanisms: R. Nuccitelli, discussion leader

S-i. Miyazaki, "Essential role of the IP_3 receptor in Ca^{2+} release at fertilization."

W. Kinsey, "Role of tyrosine protein kinases in egg activation."

Insights into fertilization biology from studies of other cells: P. Primakoff, discussion leader

C. Buck, "Integrins and other cell adhesion molecules: A general overview of structure, function and tissue-specific expression."

J. Brugge, "Platelet activation: Signal transduction events regulated by integrin receptors."

M-m. Poo, "Nerve muscle interaction and transmitter secretion."

Fertilization in plant systems: W. J. Snell, discussion leader

S. Russell, "Fertilization in flowering plants."

J. B. Nasrallah, "Cellular interactions during pollination in plants."

Current topics and contributed papers: W. Clark, discussion leader

Speakers, TBA

Plenary lecture: K. Swenson, discussion leader

T. Hunt, "Control of the two meiotic and the first mitotic cell cycles in clams and frogs."

Early events in pattern formation: M. Danilchik, discussion leader

E. Houliston, "Cytoplasmic movements and symmetry breaking in the fertilized eggs of *Beroe ovata* and *Xenopus laevis*."

M. L. King, "Localization of maternal RNAs in *Xenopus*."

R. Lehmann, "Germ line determinants in *Drosophila*."

Fiber Science

Colby-Sawyer College, New London, NH

J. E. Spruiell, chair; H. Davis, vice chair

11–16 July

S. Kavesh, discussion leader

P. J. Lemstra, "On the route to X-D fibers."

J. Smook, "Gel-spinning of flexible chain polymers with intermediate polarity."

P. Smith, "Fibers of electrically conductive polymers-processing and properties."

R. E. Fornes, discussion leader

H. L. LaNieve, III, "Polymer optical fibers."

H. Ishihara, "Structure development and rubber elasticity of segmented polyurethane-urea elastic fibers."

B. Pengilly, discussion leader

A. Ziabicki, "Development of structure in high-performance fibers."

W. Knoff, "Understanding the nature of fiber strength variability: Beyond weibull and the weakest link."

D. Salem, "Microstructure modeling of diffusive transport in poly(ethylene terephthalate) fibers."

H. Davis, discussion leader

R. Young, "Application of Raman spectroscopy to the study of fiber deformation."

B. Wunderlich, "Three phases in PET fibers analyzed by thermal analysis and x-ray diffraction."

H. D. Weigman, discussion leader

R. M. Brown, "Cellulose biosynthesis and its application to fibers and textiles."

D. L. Kaplan, "Biosynthesis and processing of silk."

S. Kobayashi, "The first chemical synthesis of cellulose via enzymatic polymerization."

D. Brookstein, discussion leader

D. Wagner, "Characterizing the fiber/matrix interface in fiber reinforced composites."

P. Schwartz, "Hybrid effects in strength and stress rupture of composites."

B. C. Goswami, discussion leader

B. Fraser, "The dynamics of ballooning yarns in textile processing."

H. Meinander, "Thermal comfort properties of clothing—physical simulation of physiology problems."

F. Elkink, "Cord and loop efficiency of technical yarns."

M. Jaffee, discussion leader

J. Cunning, "Fiber science: Where we have been and where we are going—an industry view."

A. Abhiraman, "Fiber science: Where we have been and where we are going—an academic view."

D. Jose, discussion leader

L. Wadsworth, "Understanding the processing and properties of melt-blown nonwoven fabrics."

R. Shishoo, "Characterization of structural-mechanical properties of some nonwoven materials."

S. Batra, "Mechanics of nonwoven fabrics."

Free Radical Reactions

Holderness School, Plymouth, NH

M. Newcomb, chair; S. Nelsen, vice chair

25–30 July

N. Porter, discussion leader

D. P. Curran, "Recent applications of radical reactions in organic synthesis."

H. Suginome, "Recent progress in synthetic applications of alkoxy radicals."

B. Giese, discussion leader

V. H. Rawal, "Radical-induced ring fragmentation reactions."

S. Nelson, discussion leader

S. Farid, "Photoinduced electron transfer processes."

R. K. Khanna, "Role of radical ions in electrical conduction in doped polymers."

C. Chatgilialoglu, discussion leader

C. Rüchardt, "Geminal substituent effects in free radical chemistry."

M. Newcomb, discussion leader

B. Branchaud, "Galactose oxidase—a radical enzyme that catalyzes radical reactions."

M. Pirrung, "In vitro studies of the ethylene-forming enzyme."

D. Tanner, discussion leader

R. Bach, "Mechanism of oxygen transfer to alkenes and alkynes."

K. Ingold, discussion leader

J. D. Lipscomb, "Chemistry and regulation of the methane monooxygenase system."

S. J. Lippard, "Iron oxo proteins and models: Radical clocks and radical ligands."

B. Maillard, discussion leader

M. A. Fox, "Excited states of stable free radicals."

A. Beckwith, discussion leader

H. Fischer, "Rate constants for radical additions to alkenes and alkynes: Polar versus enthalpy effects."

J. Lusztyk, "Spectroscopy and kinetics of oxygen-centered radicals."

Genetic Toxicology

Colby-Sawyer College, New London, NH

S. Aaron, chair; J. Preston, vice chair

25–30 July

T. Kunkel, session chair

What is the nature of "spontaneous" mutagenesis?: B. G. Strauss, discussion leader

R. M. Schaaper, "DNA replication errors and spontaneous mutagenesis in *Escherichia coli*."

L. D. Samson, "Endogenous alkylation-induced mutagenesis in prokaryotes and eukaryotes."

P. L. Foster, "Mechanisms of adaptive mutation in *Escherichia coli*."

J. Crow, session chair

What is the impact of mutation in populations?: B. Charlesworth, discussion leader

J. Drost, "The number of cell divisions ancestral to male and female gametes in *Drosophila* mouse and human."

D. Houle, "Total rate of mutation of delerious genes affecting fitness in *Drosophila*."

C. Denniston, "Mutation component of genetic disease, with special attention to threshold traits."

T. Skopek, session chair

What are mutational spectra trying to tell us?: K. Tindall, discussion leader

H. Vrieling, "*Hprt* mutational spectra in human populations."

B. Kunz, "Mutational specificity in a yeast tRNA gene: Strand bias and strands identity."

V. Maher, "Insights into mechanisms of mutagenesis obtained from mutational spectra."

T. Cebula, session chair

New strategy for rapid detection of mutation: E. Eisenstadt, discussion leader

P. A. Cerutti, "RFLP-PCR analysis of *ras* and *p53*."

V. A. Bohr, "Genotoxic damage and repair."

R. Tennant, session chair

Evolving transgenic systems for study of germ line mutagenesis: R. Langenback, discussion leader

R. Woychik, "Insertional mutagenesis and the molecular analysis of developmental mutations."

J. Schimenti, "A recombination-based

transgenic mouse system for evaluation of genotoxicity."

D. Albertini, session chair

Human genetic disorders and mutation: B. Kovacs, discussion leader

S. S. Sommer, "Assessing the underlying pattern of human germline mutations: Lessons from the factor IX gene."

D. W. Yandell, "Comparison of the germ line versus somatic mutation spectra in RB and P53 tumor suppressor genes."

M. Anderson, session chair

What role does mutagenesis play in carcinogenesis?: E. Bresnick, discussion leader

H. Zarbl, "NMU-induced rat mammary tumors arise from cells with pre-existing Ha–ras-1 gene mutations: Implications for mechanism of carcinogenesis."

R. Wiseman, "Analysis of p53 mutations in tumors of humans and experimental rodents."

T. Caskey, "Unstable repeat sequences as a cause of disease mutations in man."

B. Lee, session chair

Is there any germ line risk?: J. Ashby, discussion leader

K. W. Turteltaub, "DNA adduct dosimetry: New methods offering increased sensitivity."

H. Mohrenweiser, "Role of sequence-specific gene mutations and non-traditional inheritance in estimation of germinal mutation rates."

Gravitational Effects in Materials and Processes

New England College, Henniker, NH

N. B. Singh, chair; J. I. D. Alexander, vice chair

18–23 July

Flow interactions with solid-liquid interfaces: M. E. Glicksman and R. Bayuzik, discussion leaders

B. Andrews, "Solidification in immiscible alloys."

L. Ratke, "Gravitational effects on ostwald ripening."

R. German, "Gravitational role in liquid phase sintering."

Thermoscapillary convection: R. F. Sekerka and H. U. Walters, discussion leaders

S. Ostrach, "Flight results on thermocapillary experiment."

R. Narayanan, "Rayleigh marangoni instabilities in microgravity."

Convection during crystal growth from the melt: D. T. J. Hurle, R. Crouch, and R. S. Feigelson, discussion leaders

S. L. Lehoczky, "Growth of binary and ternary crystals."

D. Larson, "Orbital processing of compound semiconductors."

A. L. Fripp, "Ground-based preparation for growth of multi-component crystals in microgravity."

Vapor phase crystal growth in microgravity environment: C. Barta and E. Kaldis, discussion leaders

H. Wiedemeier, "Vapor transport growth of HgCdTe."

R. Cadoret, "PVT growth of HgI_2 in microgram and 1-g environments."

Fluid dynamic instabilities: S. Coriell and J. Kearn, discussion leaders

B. Murray, "Results of study on double diffusive convection."

A. Wheeler, "Phase field models in binary systems."

P. Concus, "Capillary surface in wedge domain."

Drop dynamics and combustion phenomena: J. Saltzman, M. Lee, and R. DeWitt, discussion leaders

T. Wang, "Containerless science and applications."

H. D. Ross, "Combustion in microgravity."

J. M. Perales, "Drop and surface dynamics."

Micro-g experiments on the growth of molecular crystals: D. Frazier, F. Rosenberger, and T. Mookerji, discussion leaders

A. Chernov, "Convection effects on solution growth."

L. DeLucas, "Protein crystal growth in microgravity."

R. Lal, "Growth of triglycine sulfate in IML-1 and effect of g-jitter."

Fundamental science: R. Snyder and R. Mazelsky, discussion leaders

T. Nishinaga, "First materials processing test of Japanese experiment."

J. Lipa, "λ point experiment."

Microgravity and segregation: R. H. Hopkins, T. Glasgow, and R. Sokolowski, discussion leaders

D. Camel, "Results of the flight of MEPHISTO on USML-1."

R. W. Smith, "Growth of eutectics and 12 liquid diffusion."

D. Mattheisen, "Dopant segragation in GaAs: Results of flight experiment."

Contact J. Iwan Alexander for the poster session.

Heterocyclic Compounds

New Hampton School, New Hampton, NH

T. W. Goodwin, chair; S. W. McCombie, vice chair

4–9 July

L. E. Overman, "New strategies for the synthesis of heterocyclic natural products."

T. R. Hoye, "Heterocycles as stereochemical playgrounds."

J. E. Baldwin, "Synthetic approaches to bioactive heterocycles from microorganisms and sponges."

K. S. Takaki, "Synthesis and biological evaluation of napthothiophenimines."

W. B. Choi, "Recent advances in the synthesis of carbapenems."

D. L. Boger, "Bleomycin A2: Synthetic and mechanistic studies."

K. Fuji, "Memory of chirality."

P. A. Lartey, "Synthetic modifications of erythromycin A."

E. Wenkert, "Alkaloid synthesis."

J. E. Audia, "Formal 3+3 aza-annulation: Stereochemistry and applications to medicinally interesting compounds."

A. T. Vasella, "Reactivity of tetrahydropyran-2-ylidene carbenes."

M. M. Joullié, "Synthesis of novel thiophene analogs of ninhydrin."

F. X. Talamas, "Diels-Alder reactions of 3-vinylfurans."

D. B. Reitz, "Potent heterocyclic angiotensin II receptor antagonists."

T. J. Delia, "Reactions of halopyrimidines: A tale of three chlorines."

V. Snieckus, "Heterocyclic excursions based on the directed metalation–cross coupling symbiosis."

M. T. Crimmins, "Synthetic studies on the ginkgolides."

A. M. Churakov, "New high nitrogen heterocyclic compounds containing a diazene oxide fragment as part of a cycle: Their stability and problems with their synthesis (synthesis and chemistry of fused 1,2,3,4-tetrazine 1,3-Di-N-oxides)."

B. E. Maryanoff, "Macrocyclic inhibitors of serine protease enzymes: The cyclotheonamide story."

P. K. Jadhav, "Computer-assisted design of potent, non-peptide inhibitors of HIV protease."

J. W. Grissom, "The tandem enediyne cyclization: Heterocycle and carbocycle formation."

S. P. Tanis, "Studies on thiazolidinedione antihyperglycemic agents."

N. Carruthers, "Conformational considerations in the design of dual antagonists of PAF and histamine."

Holography and Optical Signal Processing

Plymouth State College, Plymouth, NH

F. T. S. Yu, chair; W. T. Cathey, vice chair

27 June–2 July

Optical signal processing and computing: N. George, discussion leader

A. Huang, "Process of digital optics computing at AT&T."

D. Casasent, "Multifunctional optical scene analysis processors."

G. G. Mu, "Recent advances of optical signal processing and computing in China."

Optical neural networks: H. K. Liu, discussion leader

T. W. Lu, "Interpattern association neural networks."

T. Yatagai, "Architecture and models of optical neural networks."

Novel techniques for optical signal processing: H. J. Caulfield, discussion leaders

H. Szu, "Adaptive wavelet transforms."

Y. Li, "Free-space optical multiple-access networks for interconnections."

D. A. Gregory, "Adaptive optical correlators for target tracking."

Morphological optical signal processing: W. T. Cathey, discussion leader

T. H. Chao, "Techniques and application of morphological signal processing."

Optical memory and photorefractive crystal signal processing: P. Yeh, discussion leader

A. B. Bhalla, "Optical properties and applications of photorefractive fibers."

A. L. Mikaelian, "Research and application of optical memories in C.I.S."

C. Gu, "Applications of photorefractive crystals to optical computing."

Synthetic holography: E. N. Leith, discussion leader

Y. N. Denisyuk, "Development of reflection and pseudo depth holography."

D. H. Hsu, "Display holography in China."

Acousto-optic signal processing and neural computing: A. Karpel, discussion leader

V. Lugt, "Recent advances on A-O cell signal processing."

A. Goutzonlis, "Synthesis and fabrication of 2-D AO cell."

N. H. Farhat, "The bifurcating neuron—the role of synchronicity and chaos and neural computation."

Short topics: F. T. S. Yu, discussion leader

S. L. Zhuang, I. Karim, "Super resolution and optical computing."

S. Kulakov, V. Sokolov, S. Lee, "Electro-optic devices for optical processing."

Information optics, digital optics, and holography: A. A. Frieson, discussion leader

A. Lohmann, "Information optics."

P. Chevel, "Digital-optical computing in France."

T. H. Jeong, "Progress of photopolymer holography."

Hormonal Carcinogenesis

Salve Regina University, Newport, RI

S. Sukumar, chair; G. Cunha, vice chair

8–13 August

Breast cancer I: S. Nandi, discussion leader

B. Henderson, "Epidemiology of breast cancer."

C. Jordan, "Tamoxifen in breast cancer prevention."

M. Archer, "The molecular basis of mammary carcinogenesis in Copenhagen rats."

Breast cancer II: G. Stancel, discussion leader

P. Sassone-Corsi, "Hormonal regulation of *fos-jun* function."

R. P. DiAugustine, "Functional aspects of EGF-like peptides in ovarian-steriod responsive organs."

Prostate cancer: A. Soto, discussion leader

S-m. Ho, "The cojoint actions of androgens and estrogens in the induction of proliferative lesions in the rat prostate."

A. Thigpen, "Steroid 5a-reductase in prostate cancer."

J. T. Isaacs, "Role of programmed cell death in hormonal carcinogenesis."

Liver cancer: J. Li, discussion leader

J. D. Yager, "Liver growth stimulation and suppression in rats treated with ethinyl estradiol."

J. Coe, "Estrogen-initiated hepatocarcinogenesis in the Armenian hamster."

Cancers of the female reproductive tract: G. Cunha, discussion leader

A. Herbst, "DES exposure, developmental abnormalities, and cancer in the reproductive tract."

J. Boyd, "Genetic characterization of human endometrial carcinoma."

R. Newbold, "Uterine adenocarcinoma following developmental treatment with diethylstibesterol: A murine model for hormonal carcinogenesis."

Ovarian cancer: G. Mueller, discussion leader

J. Richards, "Molecular mechanisms involved in the hormonal regulation of ovarian cell differentiation."

W. G. Beamer, "Hormonal carcinogenesis in genetically altered mice (ovarian granulosa cell tumorigenesis)."

Hormonal carcinogenesis and the environment: J. McLachlan, discussion leader

W. F. Greenlee, "Molecular basis of dioxin actions on rodent and human target tissues."

G. Lucier, "Risk assessment of receptor-mediated carcinogens."

T. Colburn, "Environmental effects of the development of hormonally responsive tissues."

Hormonal carcinogenesis: A historical perspective: J. Russo, discussion leader

E. Jensen, "The estrogen receptor: History and current concepts."

New frontiers: D. Coffey, discussion leader

C. Sapienze, "Genomic imprinting and pediatric cancer."

J. Wang, "Interaction between proto-oncogene and anti-oncogene in cell cycle control."

W. Vale, "Novel growth factors: The activins and inhibins."

Hormone Action

Kimball Union Academy, Meriden, NH

R. Maurer, chair; S. McKnight, vice chair

1–6 August

Membrane receptors, signal transduction.

P. Kelly, "Receptor domains involved in growth hormone and prolactin signal transduction."

L. Marsh, "The α-factor receptor of yeast: Activation and desensitization."

L. Limbird, "Alpha$_2$-adrenergic receptors: Structural basis for multiple functions."

P. Casey, "Prenylation and G protein signaling."

Regulatory roles of calcium and calmodulin.

A. Means, "Calcium and calmodulin regulation of cell growth and differentiation."

T. Davis, "Functions of calmodulin during cell proliferation: Mitosis and more."

E. O'Neill, "The role of calcineurin in T cell activation."

Steroid receptors I.

W. Chin, "Thyroid hormone receptors: Ligand and protein:protein interactions."

D. DeFranco, "Regulation of steroid receptor nuclear transport."

B. Katzenellenbogen, "Estrogen receptor structure-function relationships."

B. O'Malley, "Molecular mechanisms of gene transactivation by intracellular receptors."

Mechanism of cAMP action.

J. Scott, "Subcellular localization of the cAMP-dependent protein kinase, a possible key to hormone action?"

S. McKnight, "cAMP-regulated kinases."

J. Habener, "Phosphorylation-dependent activation of transcription factor CREB."

Signal transduction.

R. Mortensen, "Inactivation of G protein genes: Double knockout with a single construct."

E. Ross, "Selectivity and regulation of receptor-G_q-PLC pathways."

M. Rosner, "Regulation of EGF signaling pathways."

M. White, "The role of IRS-1 in insulin signal transmission."

Steroid receptors II.

M. Parker, "Role of ligand binding in estrogen receptor functions."

G. Firestone, "Glucocorticoid suppression of tumor cell growth and regulation of cell-cell contact."

D. Hogness, "Genetic regulatory hierarchies controlling the metamorphic response to ecdysone in *Drosophila*."

Signal transduction/phosphorylation and the regulation of transcription.

M. Carlson, "A protein kinase and transcriptional control in yeast."

S. Fields, "Pheromone-responsive transcription in yeast."

M. Gilman, "SRF-homeodomain complexes and the specificity of nuclear signal transduction."

D. Reinberg, "Regulation of initiation of transcription by RNA polymerase II."

Interaction of steroid receptors with other transcription factors.

D. Granner, "Complex hormone response domains."

K. Yamamoto, "Combinatorial regulation by steroids at a composite response element."

Neuroendocrine regulation of gene expression.

P. Mellon, "Neuroendocrine gene expression in the reproductive system."

J. Richards, "Diverse cellular signaling pathways mediate hormonal control of gene expression in differentiating ovarian cells."

L. Jameson, "Negative regulation by thyroid hormone."

Hydrogen-Metal Systems

Tilton School, Tilton, NH

P. Jena, H. Wipf, co-chairs; R. Bowman and Y. Fukai, co-vice chairs

18–23 July

H_2 adsorption and dissociation on surfaces: L. Schlapbach, discussion leader

C. T. Rettner, "Activated dissociative adsorption of H_2 on Cu."

K. W. Jacobsen, "Dissociation path of H_2 on Al."

Surface diffusion: R. Gomer, discussion leader

X. D. Zhu, "Quantum tunneling of hydrogen and deuterium on Ni studied by optical diffraction method."

Hydrogen in semiconductors: J. I. Pankove, discussion leader

N. M. Johnson, "Hydrogen in semiconductors."

J. Boland, "STM of hydrogen structures on semiconductors surfaces."

Hydrogen diffusion: Y. Kagan, discussion leader

H. Dosch, "H in Nb: The interplay between diffusion and lattice distortions."

H-D. Carstanjen, "Low temperature hydrogen diffusion in transition metals."

Hydrogen in multilayers: C. P. Flynn

B. Hjörvarsson, "Hydrogen in metallic superlattices."

Hydrogen in oxides: H. K. Birnbaum, discussion leader

Y. Chen, "Low temperature diffusion of H and D in oxide crystals?"

A. Weidinger, "Hydrogen in high-T_c superconductors."

Interactions of hydrogen with metal clusters: A. E. Depristo, discussion leader

S. J. Riley, "Hydrogen interactions with Ni clusters."

B. K. Rao, "Atomic and electronic structure of hydrogen-metal cluster complexes."

Novel materials: D. Cox, discussion leader

J. Brewer, "Muonium in fullerenes."

Theoretical methods: M. Gupta, discussion leader

A. McDowell, "Monte Carlo calculations of NMR relaxation rate due to diffusion in amorphous metals."

C. Elsässer, "Potential energy surfaces and vibrational states."

J. L. Whitten, "Study of adsorption of hydrogen of Ni surfaces using cluster models."

D. Tomanek, "Hydrogen embrittlement."

New techniques: M. H. Mintz, discussion leader

J. Mayers, "Neutron compton scattering on metal-hydrogen systems."

J. W. Rabalais, "Direct determination of hydrogen surface sites from time-of-flight scattering and recoiling spectrometry (TOF-SARS)."

Hydrogen pairing: R. Barnes, discussion leader

M. Conradi, "Anomalous high-temperature nuclear spin-relaxation: What have we learned?"

General interest lecture: E. Wicke, discussion leader

D. Manchester, "Some anecdotal history of metal-hydride studies."

Technological aspects: G. Sandrock, discussion leader

T. Sakai, "Electrochemical hydriding and dehydriding."

K. L. Wilson, "Hydrogen in first wall materials of fusion reactors."

High pressure hydrides: B. Baranowski, discussion leader

Y. Fukai, "A novel mode of hydrogenation under high pressure."

H. Wipf, "Concluding remarks."

Hydrologic, Geochemical, and Biological Processes in Forested Catchments

Holderness School, Plymouth, NH

C. T. Driscoll, chair; C. Kendall, vice chair

1–6 August

H. Hultberg, "The biogeochemistry of catchments: Experiments and monitoring to quantify natural and manmade effects on ecosystems, with examples from the Lake Gardjon experimental watershed in southwestern Sweden."

Upland systems: M. Mitchell and D. Johnson, discussion leaders

J. Aber, "Global change effects on carbon, nitrogen, and water balance of New England forest ecosystems: The interaction of multiple stresses at the regional scale."

A. Jenkins, "Interpretation of plot and catchment scale hydrochemical data within a rigorous process-based framework."

Upland systems: M. Mitchell and D. Johnson, discussion leaders

D. Grigal, "Extrapolation of forest ecosystem elemental cycles in space and time: Opportunities and pitfalls."

Stream/near stream systems: K. Bencala and C. Pringle, discussion leaders

F. Triska, "Interdisciplinary considerations in examining nutrient retention-transport at the hyporheic-stream interface in forested catchments."

P. Mulholland, "Stream chemistry: A reflection of the hydrologic coupling of biogeochemical processes in forested catchments."

C. Dahm, "Hydrology and biogeochemistry of hyporheic zones of small mountain streams."

Stream/near stream systems: K. Bencala and C. Pringle, discussion leaders

P. Wiberg, "Stream flow/channel bed interactions in mountain streams."

Field trip to Harvard Forest, Petersham, Massachusetts: R. Boone and J. Aber, tour leaders

Wetland systems: H. Hemond and E. Gorham, discussion leaders

C. Johnston, "Beaver wetlands and watershed biogeochemistry."

D. Siegel, "Hydrogeology of wetlands: Paradigm lost?"

C. Richardson, "Nutrient cycling in southern wetland ecosystems."

Wetland systems: H. Hemond and E. Gorham, discussion leaders

N. Roulet, "Biotic and abiotic factors in the flux of methane from peatlands."

Global systems: J. Schnoor and S. Trumbore, discussion leaders

S. Trumbore, "Using carbon isotopes to extrapolate from local to global sites."

J. Galloway, "Nitrogen in forested ecosystems responding to global change."

W. Schlesinger, "Heterogeneity of soil biogeochemistry during global change in deserts."

Inorganic Chemistry

Brewster Academy, Wolfeboro, NH

W. J. Evans, chair; G. J. Kubas, vice chair

25–30 July

Main group chemistry: A. H. Cowley, discussion leader

M. F. Hawthorne, "Anti-crown hosts: Design, synthesis, and structure-reactivity relationships."

L. G. Sneddon, "Polymeric precursors to boron-based ceramics."

W. G. Klemperer, "New ways to make old zeolites and old ways to make new zeolites."

Biological inorganic chemistry: A. Butler, discussion leader

D. Riley, "Rational design of functional mimics of superoxide dismutases as pharmaceutical agents."

S. J. Lippard, "Methane monoxygenase, models, and mechanism."

Polymetallic chemistry: H. D. Kaesz, discussion leader

H. Schmidbaur, "News from gold chemistry."

T. P. Hanusa, "Designing the structures for alkaline-earth complexes: Balancing ligand bulk and basicity."

C. K. Schauer, "Phosphorus-capped metal clusters: Molecular building blocks to extended assemblies."

H. R. Allcock, "Inorganic synthesis and structure as access routes to polymers and advanced materials."

Luminescent aspects of inorganic chemistry: L. Stuhl, discussion leader

J. F. Ackerman, "Structures and properties of new oxyfluoride phosphors."

A. B. Ellis, "Semiconductor surface coordination chemistry probed by photoluminescence methods."

Environmental inorganic chemistry: D. L. Packett, discussion leader

L. E. Manzer, "Inorganic materials: Their role in the development of chlorofluorocarbon (CFC) alternatives."

A. Sattelberger, "Nuclear waste storage and remediation: The Hanford tanks problem."

K. N. Raymond, "Stereognostic metal ion coordination."

Non-traditional reaction conditions: K. J. Klabunde, discussion leader

T. B. Brill, "Reactions in supercritical water."

S. G. Shore, "Preparation of amorphous boron nitride and its conversion to a tubularstatic form containing a new tabular morphology."

Extended systems: A. L. Rheingold, discussion leader

C. Floriani, "Designing molecules for functions: From molecular batteries to chiral aggregates."

M. D. Hopkins, "Experimental studies of the nature of the metal-carbon triple bond."

S. M. Kauzlarich, "Transition metal zintl compounds."

D. W. Murphy, "Intercalation chemistry: Useful reactions, new materials, and enhanced physical properties."

Global perspectives on inorganic chemistry: J. P. Fackler, discussion leader

M. E. Vol'pin, "New ideas in the bioinorganic chemistry: The activity of cobalt complexes in biochemical and biological systems."

F. A. Cotton, "Balancing pure and applied research in the world of 1993."

Interfacial inorganic chemistry: G. J. Kubas, discussion leader

F. A. Armstrong, "Iron-sulfur clusters in action."

J. L. Burba, "Aqueous and non-aqueous mixed metal layered hydroxide gels."

G. Pez, "Chemically mediated separation membranes."

Inorganic Geochemistry

Tilton School, Tilton, NH

R. J. Bodnar, S. E. Kesler, cochairs; R. E. Beane, vice chair

15–20 August

Nature of ore-forming solutions I: Metal transport and deposition: H. C. Helgeson, discussion leader

D. A. Sverjensky, "Metal transport and deposition in high temperature hydrothermal solution."

M. H. Reed, "Reaction of magmagitically derived fluids with wall rock during ascent: Consequences for metal ratios and effect of fluid boiling on ore and gangue assemblages in the shallow environment."

W. E. Seyfried, Jr., "Experimental and theoretical constraints on metal mobility in sub-seafloor hydrothermal systems."

Mineralization in porphyry and epithermal environments: R. Beane, discussion leader

S. R. Titley, "The porphyry-epithermal connection?"

R. Jannas, "Epithermal Au-Ag in the Chilean Cordillera."

P. G. Vikre, "Magmatic-hydrothermal evolution of Goldfields, Nevada."

Nature of ore-forming solution II: Analysis of ore-forming solutions: H. Ohmoto, discussion leader

A. Anderson, "PIXE and synchrotron XRF analysis of metals in individual fluid inclusions."

T. Shepherd, "Laser ablation ICP-MS analysis of metals in single fluid inclusions."

G. Landis, "Rapid quantitative analysis of fluid inclusion gas chemistry."

Sediment-hosted and mesothermal gold deposits: C. A. Kuehn, discussion leader

B. Bekken, "Macroscopic to microscopic occurrence and association of gold in sediment-hosted disseminated gold deposits."

A. Hofstra, "Processes of ore formation for the carlin-type deposits in the Jerritt Canyon district, Nevada."

R. W. Kerrich, "Geochemistry of mesothermal gold deposits."

Nature of ore-forming solutions III: Isotope systematics: H. Taylor, discussion leader

A. N. Halliday, "Recent developments in dating ancient crustal fluid flow."

D. R. Cole, "Applications of stable isotope geothermometry and speedometry to hydrothermal systems: Progress, problems, and prospects."

L. Snee, "Isotope age measurements in hydrothermal systems."

Basin-related ore deposits: D. Sangster, discussion leader

V. Wall, "Sediment-hosted base metal deposits—some Australian prterozoic giants."

M. Hitzman, "Geology and geochemistry of Irish base metal deposits."

N. Phillips, "New ideas from the Witwatersrand gold fields."

Nature or ore-forming solutions IV: Fluid flow and water-rock interactions: A. C. Lasaga, discussion leader

R. M. Capuano, "Geochemical evidence of fluid flow in geopressured basins."

A. Meijer, "Metal transport and sorption in low-temperature hydrothermal fluids."

T. Vennemann, "Nature and significance of hydrogen isotope fractionation in epithermal and mesothermal systems."

Ion Containing Polymers

Plymouth State College, Plymouth, NH

D. N. Schulz, chair; B. Chu, vice chair

11–16 July

Polyelectrolyes: P. Dubin, discussion leader

M. Antonetti, "Structure and dynamics of model polyelectrolytes."

E. Amis, "Polyelectrolytes in solution: Rings, spheres, and chains."

K. Kremer, "Structural properties of polyelectrolyte solutions: Simulation investigations."

Complex polyelectrolytes: D. G. Peiffer, discussion leader

M. Tirrell, "Self-assembly of hydrophobically modified polyelectrolytes."

J. C. Galin, "Hydrophobic and hydrophobic zwitterionic polymeric materials: Synthesis, solution, and bulk properties."

Ionomers. Theory and solution properties: W. J. MacKnight, discussion leader

T. Witten, "The pairing model of ionic association: How ion placement controls chain conformation and phase behavior."

J. S. Higgins, "Scattering studies of associating polymer solutions."

B. Chu, "Supramolecular structures of block ionomers in solutions."

Ionomers: Synthesis and morphology: B. Gunesin, discussion leader

R. Storey, "Design and synthesis of non-random, model ionomers."

R. Moore, "Morphological investigations of semicrystalline ionomers."

Ionomers: Bulk properties: A. Eisenberg, discussion leader

G. Wilkes, "Structure-property studies of segmented and telechelic ionomers."

M. Hara, "Mechanical properties of ionomers and their blends."

R. Register, "Blends of styrenic ionomers with (poly)xylenyl ether."

Applications of ionomers: W. Bahary, discussion leader

E. N. Drake, "Controlled release of ionomer coatings."

Novel ion-containing materials: K. A. Mauritz, discussion leader

S. Stupp, "Organoceramics: Nanocomposites formed by mineral nucleation in the presence of ion-binding or ionizable polymers."

J. R. Reynolds, "Rigid rod and high aspect ratio aromatic polyelectrolytes and their use in conducting polymer composites."

R. Baughman, "Conducting polymers as ion storage materials: Present advances and future dreams."

Innovation: C. W. Martin, discussion leader

R. V. Jenkins, "Continuity and context in the creativity of Thomas Edison."

Specialty monomers and polymers: R. Weiss, discussion leader

R. K. Pinschmidt, Jr., "Cationic and amine functional polymers and copolymers from *N*-ethenylforamide."

W. M. Risen, "New lanthanide ion containing copolymers."

T. Zawodzinski, Jr., "Perfluorosulfonic acid membranes: Characterization and performance in fuel cells."

Laser Diagnostics in Combustion

Plymouth State College, Plymouth, NH

K. C. Smyth, chair; J-P. Taran, vice chair

11–16 July

Fundamental issues—gas phase: D. Greenhalgh, discussion leader

J-P. Taran, "CARS: New approaches and perspectives for the future."

L. Rahn, "Nearly degenerate four-wave mixing measurements of population lifetimes."

K. Kohse-Höinghaus, "The dynamic OH model for concentration and temperature measurements."

Fundamental issues—condensed phases: R. Chang, discussion leader

M. Winter, "Diagnostic measurements of fundamental processes in droplets."

R. Santoro, "Particle size measurements: From spheres to aggregates."

Resonant wave-mixing: J. Jeffries, discussion leader

R. Farrow, "Effects of quenching and thermal gratings in degenerate four-wave mixing."

S. Williams, "Degenerate four-wave mixing measurements of CH^- in flames and plasmas."

P. Ewart, "Imaging and temperature measurement of flames by DFWM."

Diagnostics in the infrared: G. Rosasco, discussion leader

H. Miller, "Quantitative tunable diode laser measurements of concentrations and temperature in hydrocarbon diffusion flames."

T. Brill, "Spectroscopy of chemical reactions in supercritical water."

Chemistry-turbulence interactions: R. Dibble, discussion leader

J. Driscoll, "Diagnostic challenges to understanding flame-vortex interactions."

R. Pitz, "UV Raman measurement of reaction zones: The chemistry/scalar dissipation rate interaction."

M. Long, "Mixture fraction imaging in turbulent non-premixed flames."

The modeler's view: K. Smyth, discussion leader

G. Smith, "Kinetic meaning of diagnostic measurements in premixed flames."

P. Lindstedt, "Role of laser diagnostics in the development of detailed kinetics for hydrocarbon diffusion flames."

Diagnostics in nasty environments: J. Wolfrum, discussion leader

P-E. Bengtsson, "Development and applications of rotational CARS."

V. Sick, "Simultaneous LIF temperature and concentration measurements in practical devices."

M. Drake and T. Fansler, "High-speed visualization of fuel sprays and combustion in engines."

Diagnostics in fast flows: R. Miles, discussion leaders

B. McMillan, "Two-line instantaneous temperature and velocity imaging in supersonic mixing and combusting flows."

G. Laufer, "LIF measurements in a H_2/air supersonic combustion tunnel."

Large scales and short times: P. Paul, discussion leader

J. ter Meulen, "LIF imaging of molecular distributions in small- and large-scale flames."

G. Fiechtner, "Picosecond pump-probe absorption spectroscopy for species concentration measurements in turbulent flames."

Lipid Metabolism

Kimball Union Academy, Meriden, NH

G. M. Carman, chair; A. Tall, vice chair

27 June–2 July

Phosphatidylcholine metabolism: C. Kent, discussion leader

C. Kent, "Regulation of CTP: Cholinephosphate cytidylyltransferase activity."

S. Jackowski, "Cell cycle regulation of CTP: Cholinephosphate cytidylytransferase activity."

D. E. Vance, "A unique phosphatidylethanolamine methyltransferase is located in a mitochondrial-associated ER fraction of rat liver."

T. McIntyre, "Formation and metabolism of platelet-activating factor-like bioactivity."

Lipid synthesis in bacteria: W. Dowhan, discussion leader

T. J. Larson, "Characterization of a lipid biosynthetic operon of *Escherichia coli*."

C. O. Rock, "Regulation of fatty acid biosynthesis in *Escherichia coli*."

W. Dowhan, "Role of phospholipids in cell function."

Sphingolipid metabolism: A. H. Merrill, discussion leader

A. H. Merrill, "Regulation of sphingosine biosynthesis and catabolism."

Y. A. Hannun, "The role of sphingolipid-derived products in signal transduction and cell regulation."

R. M. Bell, "Role of ceramide in cellular regulation."

R. E. Pagano, "Intracellular transport of fluorescent lipid analogs."

Lipid synthesis in yeast: S. A. Henry, discussion leader

C. E. Martin, "Fatty acid desaturation in yeast."

S. A. Henry, "Genetic regulation of phospholipid synthesis in yeast."

R. L. Lester, "Biochemical genetics of sphingolipids in yeast."

Lipid transport: D. R. Voelker, discussion leader

J. Storch, "Fatty acid binding proteins and intracellular transport of fatty acids."

D. R. Voelker, "Properties of phospha-

tidylserine synthesis and translocation in permeabilized mammalian cells."

R. G. Sleight, "Trafficking of lipids at the plasma membrane."

K. W. A. Wirtz, "Regulation and localization of the phosphatidylinositol transfer protein."

Lipid metabolism of cell surfaces: E. P. Kennedy, discussion leader

E. P. Kennedy, "Metabolism of membrane lipids and cell signaling in bacteria."

M. S. Anderson, "Molecular biology of lipid A biosynthesis."

P. T. Englund, "Incorporated of myristate into trypanosome GPIs by fatty acid remodeling."

Phosphatidylinositol metabolism: P. W. Majerus, discussion leader

P. W. Majerus, "Molecular mechanisms of intracellular signaling."

L. Pike, "Phosphatidylinositol 4-kinase and the role of phosphoinositides in cellular regulation."

L. Cantley, "Phosphatidylinositol 3-kinase."

T. Takenawa, "Phosphatidylinositol 4,5-bisphosphate binding proteins and phospholipase C."

Cholesterol metabolism: D. W. Russel, discussion leader

D. W. Russel, "Molecular genetics of steroid 5α-reductase."

G. Harris, "Mechanistic studies of steroid 5α-reductase."

A. Tall, "Mechanism of regulation of cholesteryl ester transfer protein gene expression by dietary cholesterol."

Phospholipases and signal transduction: S. G. Rhee, discussion leader

R. W. Gross, "Mechanism of activation of intracellular phospholipase A_2."

C. Leslie, "Phosphorylation of a high molecular weight, arachidonoyl-hydrolyzing phospholipase A_2 in macrophages."

S. G. Rhee, "Regulation of phosphoinositide-specific phospholipase C isozymes."

Liquid Crystals

Brewster Academy, Wolfeboro, NH

B. Doane, chair; D. Litster, vice chair

20–25 June

Novel materials and phases I: R. Pindak, discussion leader

F. A. Tournilhac, "Polyphiles: Achiral mesomorphic ferroelectrics."

R. Petschek, "Novel ferroelectric liquid crystals."

P. Fabre, "Amphicolloids: Hybrid liquid crystals."

S. Fraden, "Magnetic field–induced isotropic nematic phase transition in suspensions of viruses particles."

Novel materials and phases II: C. Garland, discussion leader

J. Prost, "Longitudinal ferroelectricity: Equilibrium and out of equilibrium aspects."

A. Fukuda, "Competition between ferroelectric and antiferroelectric interactions."

S. Lattermann, "Metallomesogens with azacycloalkane ligands."

Surface phenomena: G. Durand, discussion leader

D. Hornreich, "Surface ordering and Kosterlitz-Thouless transitions in nematic liquid crystals."

O. Lavrentovich, "Structures with non-zero Gaussian curvature in liquid crystals."

T. Uchida, "Anchoring energy on polymer surface with grooves."

Pattern formations and instabilities: P. Palffy-Muhoray, discussion leader

P. Cladis, "Pattern formation at the cholesteric-isotropic interface."

L. Kramer, "New results on convective instabilities in liquid crystals."

Confinement effects: D. Allender, discussion leader

N. Clark, "Phase behavior of liquid crystals in aerogels."

S. Zumer, "Liquid crystals restricted to curved geometries."

A. Strigazzi, "Second order elasticity in nematic liquid crystals."

Applications of dispersions: R. Shashidhar, discussion leader

P. Bos, "Voltage threshold reduction using dispersed polymers."

R. Reamey, "Electro-optical behavior of liquid crystals in small cavities."

T. Gunjima, "Liquid crystal/polymer composites and projection applications."

Advances in liquid crystal applications: P. Drzaic, discussion leader

T. J. Scheffer, "Active addressing of LCDs."

D. Margerum, "Phased array radar."

J. S. Patel, "Liquid crystals in optical communication devices."

M. Schadt, "Photoinduced unaxiality: Novel alignment layers."

Phase behavior: T. Sluckin, discussion leader

R. Blinc, "Ferro- and antiferroelectric liquid crystals: Restricted geometry and field effects."

D. Dunmur, "Molecular chirality and chiral interactions in liquid crystal phases."

Self assembly: N. Boden, discussion leader

R. B. Meyer, "Molecular aggregate liquid crystals."

J. Schnur, "Biologically derived self-assembled microstructures."

T. Lubensky, "Order, membrane shape, and modulated liquid crystal phases."

Chemistry and Physics of Liquids

Holderness School, Plymouth, NH

C. M. Knobler, chair; J. Weeks, vice chair

8–13 August

Confined fluids

B. Frisken, "Studies of near critical fluid mixtures in silica gels."

S. Granick, "Viscoelastic dynamics of confined molecular fluids."

K. Schweizer, "Statistical mechanics of confined molecular fluids."

D. E. Sullivan, "Interfaces in complex liquids."

Kinetics of phase transitions

D. Beysens, "Kinetics of phase transitions in micro-gravity."

A. Bray, "Topological defects and phase ordering in systems with non-scalar order parameters."

D. Oxtoby, "Molecular approach to nucleation theory."

Polymer systems

S. Greer, "Structure and properties of solutions of living polymers."

I. Szleifer, "Theoretical studies of the conformational and thermodynamic behavior of polymer systems."

Molecular motions in fluids

T. Keyes, "Harmonic normal mode analysis of liquids."

J. Simon, "Probing the complexities of ionic solutions by spectroscopy."

R. Loring, "Probing liquid structure and dynamics with optical spectroscopy."

J. Tester, "Oxidation reactions in supercritical water: A review of process technology and fundamental research."

Dipolar and magnetic fluids

H. McConnell, "Electrostatics and hydrodynamics in lipid monolayers."

R. Goldstein, "Geometry, fluctuations, and hydrodynamics in lipid monolayers."

S. Singer, "Domain arrays in models with competing interactions."

P. Pieranski, "Effects of tension and thickness on phase transitions in smectic films."

Computer simulations

D. Frenkel, "Entropy driven phase transitions."

I. Benjamin, "Chemical reactions at liquid interfaces: Molecular dynamics and continuum models."

H. Andersen, "Molecular dynamics simulation of melting in two dimensions."

Those who wish to present posters at one of the two poster sessions should send their names and poster titles before 19 July to John Weeks, Institute of Physical Science and Technology, University of Maryland, College Park, MD 20742. Telephone: 301-405-4802. FAX: 301-314-9404: e-mail: jdw@ella.umd.edu.

Magnetic Resonance

Brewster Academy, Wolfeboro, NH

M. S. Conradi, chair; J. Schaefer, vice chair

11–16 July

D. Rugar, "Magnetic resonance detection and imaging using force microscope techniques."

W. Warren, "Intermolecular multiple-quantum coherences and pseudo resonances in high-resolution experiment and theory."

C. Fyfe, "Two-dimensional solid-state NMR studies of molecular sieve framework structures."

R. Tycko, "Dynamics, electronic properties, and phases of alkali fullerides."

C. S. Johnson, Jr., "Transport resolved 2D-NMR."

P. T. Callaghan, "Diffusion, diffraction, and micro-imaging."

B. Blümich, "NMR imaging of solid polymers."

A. Pines, discussion leader

P. Trommsdorff, "Rotational and translational tunneling in molecular crystals as measured by high-resolution laser spectroscopy."

R. G. Griffin, discussion leader

P. Krusic, "Free radicals generated from C_{60}."

E. J. J. Groenen, "Excited-state magnetic resonance of C_{60} crystals."

A. Schweiger, "Recent developments in pulsed EPR."

A. Garroway, discussion leader

M. Mehring, "NMR with atoms."

K. Gleason, "Multiple quantum NMR studies of motions in solids."

L. Frydman, "Two- and three-dimensional variable-angle correlation spectroscopy in solid-state NMR."

R. E. Norberg, "Slichter's contributions to magnetic resonance."

R. G. Vold, discussion leader

G. Cates, "Highly polarized xenon solid."

L. Werbelow, "The informational content of relaxation—induced multispin orders."

Barrier Properties of Mammalian Skin

Plymouth State College, Plymouth, NH

G. L. Flynn, chair; H. Boddé, vice chair

15–20 August

Biophysics of stratum corneum lipids: S. White, discussion leader

W. Plachy, "NMR studies of the stratum corneum."

M. Francoeur, "FTIR of stratum corneum lipids."

A. Williams, "Raman spectroscopy of stratum corneum."

Physiologic maintenance of epidermal barrier: M. Williams, discussion leader

T. Egelrud, "Epidermal differentiation and barrier function."

K. Feingold, "Biological response to barrier disruption."

S. Han, "Kinetics of epidermal barrier restoration."

Biological factors of barrier function: M. Ponec, discussion leader

H. Merk, "Biotransformations in the skin."

B. Monteiro-Riviere, "Biochemical mechanisms of skin toxicity."

J-P. Lepoittevin, "Molecular biology of allergenicity."

Immunological aspects of barrier function: L. Pershing, discussion leader

R. Daynes, "T cell regulation of lymphokines, barrier implications."

B. Nicholoff, "Molecular biology of inflammation process."

Electrical properties of epidermal barrier: R. Guy, discussion leader

Chizmadzhev, "Electrical field alteration of lipids."

Prausnitz, "Electroporation of stratum corneum."

T. Petelenz, "Evolving concepts in iontophoresis."

Electrical/other properties of epidermal barrier: B. Phipps, discussion leader

V. Srinivasan, "Influence of electric current on transport/function."

E. Scott, "Scanning electron microscopy of stratum corneum."

New concepts in skin transport: C. Cullander, discussion leader

A. Davis, "Controlled supersaturation and drug delivery."

G. Rao, "Reverse iontophoretic sampling."

H. Boddé, "Skin transport visualization."

Debate: Do liposomes and particles penetrate the stratum corneum?: M. Roberts, discussion leader

Pro: N. Weiner, Mezei, Cevc

Con: J. Bouwstra, Kitson, Rolland

Modeling of epidermal barrier function: R. Potts, discussion leader

A. Bunge, "Modeling of percutaneous absorption."

J. Hadgraft, "Molecular modeling of SC lipids."

R. Mrsny, "Liposomal delivery of γ-IFN into skin–rat flap model."

Mammary Gland Biology

Colby-Sawyer College, New London, NH

H. M. Farrell, chair; J. T. Emerman, vice chair

20–25 June

Mammary development and tumorigenesis: P. Rudland, discussion leader

P. Rudland, "Normal mammary growth and development."

J. Turner, "Plasmin in mammary remodeling."

M-H. Barcellos-Hoff, "Modulation of TGF-β and the extracellular matrix: Implications for tumorigenesis."

Immunobiology of crytokines in mammary health: S. Nickerson, discussion leader

L. Babiuk, "Immunobiology of cytokines."

M. Kehrli, "Cytokines in mammary disease and defense."

L. Sordillo, "Cytokines: Intervention in mastitis."

The mammary gland as a bioreactor: B. Wall, discussion leader

B. Drohan, "Production of a human anticoagulant in transgenic swine mammary tissue."

A. Colman, "Protein expression in transgenic sheep."

H. Meade, "Mammary tissue expression of cystic fibrosis protein in goats."

Mechanisms of synthesis and secretion of lipids with respect to neonate requirements: S. Zeisel, discussion leader

S. Zeisel, "Choline, its synthesis, secretion, and importance in milk."

L. Canfield, "Carotinoids in human milk: Quantification, identification, and regulation by maternal intake."

A. C. Ross, "Retinol uptake and esterification in lactating mammary gland and cultured mammary cells."

Mammary tumorigenesis: Detection therapy: C. K. Osborne, discussion leader

R. Ceriani, "Breast epithelial epitopes in breast cancer diagnosis and therapy."

C. Jordan, "ER gene transfection into refractory cells."

C. K. Osborne, "Mechanisms of hormone resistance in human breast cancer."

W. Dupont, "Premalignant markers of increased breast cancer risk."

Nutrient utilization by the lactating animal: Prognosis for increased milk secretory efficiency: L. Baldwin, discussion leader

L. Baldwin, "Computer modeling of the lactating animal: Potential and pitfalls."

J. McNamara, "Nutrient partitioning to mammary gland."

C. Reynolds, "Role of internal organs in maintenance of lactation."

New perspectives in milk protein transcription, secretion, and function: I. Mather, discussion leader

L. Berliner, "α-Lactalbumin as a multidimensional protein."

J. Godovac-Zimmerman, "β-Lactoglobulin: Its structure and possible biological function."

I. Mather, "Butyrophilin as a unique membrane protein in search of a function."

J-C. Mercier, "Qualitative and quantitative polymorphisms of caseins. Maturation of pre-mRNA and allelic and interspecies diversity."

H. M. Farrell, Jr., discussion leader

M. Peaker, "A mammary mystery tour: Perspectives on mammary biochemistry and physiology."

Growth factors regulating mammary development, differentiation, and tumorigenesis: D. Salomon, discussion leader

D. Salomon, "Role of epidermal growth factor-like proteins in mammary epithelial cell transformation."

A. Gertler, "Mammary derived factors in growth and development: Autocrine or paracrine effects?"

M. McGrath, "Effects of lactogenic and somatogenic hormones on bovine mammary growth and function."

M. Ip, "Role of growth factors on proliferation and differentiation in normal rat mammary cells."

Matrix Metalloproteinases

Plymouth State College, Plymouth, NH

C. E. Brinckerhoff, chair; H. Nagase, vice chair

15–20 August

Enzyme structure: J. F. Woessner, Jr., discussion leader

A. J. Barrett, "Proteinases: Overview."

G. Murphy, "Domain structures of MMPs."

W. Bode, "X-ray crystal structure of astacin."

E. Meyer, "X-ray crystal structure of snake venom zinc endopeptidase."

Activation mechanisms and specificity: H. Nagase, discussion leader

H. E. Van Wort, "Substrate specificity."

P. Gooley, "NMR studies of stromelysin."

G. I. Goldberg, "Regulation of extracellular activities of MMPs."

Inhibition of MMPs: T. Cawston, discussion leader

W. Stetler-Stevenson, "TIMP-2."

M. J. Banda, "TIMP-2-proMMP-2 complexes."

S. P. Hawkes, "ChIMP-3."

M. MacCoss, "Synthetic inhibitors."

Cytokine regulation of MMP gene expression: D. E. Woolley, discussion leader

S. D. Shapiro, "Metalloelastase."

S. Lacraz, "Metalloproteinase and phagocytes."

Transcriptional regulation: C. E. Brinckerhoff, discussion leader

L. M. Matrisian, "TGFβ and stromelysin gene expression."

M. Kurkinen, "The role of AP-1 in stromelysin gene expression."

P. Angel, "Characterization of the collagenase promoter."

M. E. Fini, "Control of gelatinase gene expression."

Development: J. Gross, discussion leader

Z. Werb, "MMP regulation in development."

D. R. Edwards, "TIMP regulation in development."

Metalloproteinases in disease: S. M. Krane, discussion leader

L. A. Liotta, "Tumor invasion and metastasis."

H. Birkedal-Hansen, "Periodontal disease."

K. A. Hasty, "Arthritis and inflammation."

Transcription factor cross talk among CREBS and related bZIP proteins: J. F. Habener, discussion leader

Physiological roles of MMPs and TIMPs: E. D. Harris, Jr., discussion leader

J. J. Jeffrey, "Uterine resorption."

Y. Eeckhout, "Endometrial remodeling."

T. Hayakawa, "Role of TIMPs in cell growth."

Mechanisms of Membrane Transport Proteins

Holderness School, Plymouth, NH

H. R. Kaback, chair; R. R. Kopito, vice chair

27 June–2 July

Theoretical and experimental approaches to secondary structure and dynamics: S. White, discussion leader

T. Yeates, "Structure and energetics of membrane proteins."

D. Engelman, "Helix-helix interactions in membrane protein folding and oliomerization."

W. Hubbell, "Site-directed spin labeling as a method for determining protein structure and dynamics in membrane proteins."

R. Fillingame, "Subunit c of F_1F_0ATPase: Correlation of NMR structure with function."

Theoretical and experimental approaches to secondary structure and dynamics: A. Karlin, discussion leader

C. Manoil, "Genetic analysis of membrane protein topology."

R. Wright, "Gene fusion approaches for studying the functions of the HMG-CoA reductase membrane domain."

E. London, "Using fluorescence quenching to analyze membrane protein structure."

J. Falke, "Engineered cysteines as probes for protein structure and dynamics."

Crystallography: J. Lanyi, discussion leader

J. Diesenhofer, "High-resolution structures of photosynthetic reaction centers."

R. Henderson, "Bacteriorhodopsin structure and structural charges."

J. Rosenbusch, "Porins from *Escherichia coli*: Function, genetics and structure."

S. H. Kim, "A mechanism of transmembrane signaling in bacterial chemotaxis receptors suggested from crystal structures."

Primary transporters: G. Sachs, discussion leader

D. Oesterhelt, "Vectorial catalysis by retinal proteins."

C. Slayman, "Structure and function of the yeast plasma-membrane H^+-ATPase."

J. Kaplan, "Candidate residues for the cation binding sites on the Na,K-ATPase."

P. Dimroth, "The Na^+-translocating F_1F_0 ATPase of *Propionigenium modestum*: Mode of ion translocation across the F_0 moiety."

Secondary transporters: Symporters: P. Henderson, discussion leader

W. Konings, "Comparison between Na^+- and H^+-dependent secondary transport systems in bacteria."

E. Wright, "Biophysics of Na^+/glucose co-transport."

B. Kanner, "GABA and glutamate transporters in rat brain: Distinct mechanisms and superfamilies."

G. Rudnick, "Pharmacology and molecular biology of biogenic amine transporters."

Secondary transporters: Antiporters: E. Padan, discussion leader

S. Schuldiner, "Na^+/H^+ antiporters in bacteria: Molecular devices for pH homestasis and adaptation to salinity."

P. Maloney, "Engineering of a bacterial membrane carrier: Trying to find the hole."

K. Philipson, "Sodium-calcium exchange."

R. Reithmeier, "Structural studies of the erythrocyte anion exchanger."

Regulation: C. Miller, discussion leader

S. Cushman, "Cell biology of insulin action on glucose transport."

J. Pouysseguer, "MAP kinase cascade and Na^+/H^+ exchanger activation."

S. Grinstein, "Regulation of proton transport during pH regulation."

I. Levitan, "Modulation of potassium channel activity by protein phosphorylation."

Biosynthesis and processing: Q. Al-Awqati, discussion leader

T. Claudio, "Conformational changes in AChR assembly intermediates precede subsequent subunit additions."

D. Fambrough, "Subunit assembly and intracellular transport of the Na,K-ATPase."

W. Agnew, "Ion channels from cloned cDNA's: Expression and modulation."

MDR, CFTR and related transporters: C. Higgins, discussion leader

G. Ferro-Luzzi Ames, "Bacterial periplasmic permeases as model systems for MDR and CFTR."

P. Gros, "Functional analysis of the multidrug resistance (MDR) family of transport proteins."

J. Riordan, "The role of CFTR in epithelial salt transport."

M. Welsh, "How mutations in CFTR cause Cl^- channel dysfunction in cystic fibrosis."

Mechanisms of Toxicity

Kimball Union Academy, Meriden, NH

R. M. McClain, chair; E. Faustman, vice chair

4–9 July

Tumor promotion—TGFβ: R. Jirtle, discussion leader

D. Rifkin, "Activation of latent TGFβ."

A. Glick, "TGFβ in skin tumor promotion."

R. Jirtle, "TGFβ in hepatic tumor promotion and regeneration."

Tumor promotion—hepatocyte growth factor (HGF): G. Michalopoulos, discussion leader

P. Godowuski, "Functional analysis of HGF."

G. Michalopoulos, "HGF in liver carcinogenesis and regeneration."

Carcinogenesis—oncogenes: M. Anderson, discussion leader

E. Liu, "Oncogene pertubations in cancer."

A. Pellicer, "N-ras gene and cooperation with NMU."

M. Anderson, "Oncogene activation in lung tumorigenesis."

Carcinogenesis—tumor suppressor genes: A. Klein-Santo, discussion leader

C. J. Conti, "Tumor suppressor gene inactivation."

J. C. Barrett, "Mechanisms of tumor suppression."

A. Klein-Santo, "p53 in carcinogenesis."

Developmental toxicology—receptors: A. A. Levin, discussion leader

A. A. Levin, "Retinoid receptors and teratogenesis."

J. F. Grippo, "Overexpression of homeobox genes."

T. Lufkin, "Homeobox gene knockouts."

Teratogenesis: B. Abbott, discussion leader

B. Abbott, "Receptor mechanisms for cleft palate."

T. Scherson, "Neural crest abolition and cranio-facial defects."

Ah receptor and dioxins: A. Poland, discussion leader

A. Poland, "Biology and chemistry of the Ah receptor."

W. Greenlee, "Expression of target genes."

J. Whitlock, "Transcriptional control."

Risk assessment—dioxins: L. Birnbaum, discussion leader

L. Birnbaum, "Dioxin toxicity and risk assessment."

Programmed cell death: E. Faustman, discussion leader

G. Corcoran, "Apoptosis: Compliment or antithesis of necrosis."

T. Curan, "C-Fos expression and apoptosis."

D. Hockenbery, "bcl-2 inhibition of apoptosis."

Medicinal Chemistry

Colby-Sawyer College, New London, NH

D. Triggle, chair; J. Plattner, vice chair

1–6 August

Drug therapy of invasion and metastasis: L. Liotta, discussion leader

J. Henkin, "Targeting the invasive and growth factor activities of urokinase."

W. S. Stevenson, "Metalloproteinase inhibitors."

E. Kohn, "Signal transduction therapy."

D. Hanahan, "Angiogenesis model."

Combinatorial diversity libraries: The next generation: M. R. Pavia, discussion leader

R. A. Houghton, "Pharmaceutical drug development using combinatorial libraries."

W. H. Moos, "Peptoid diversity: A game of numbers."

J. S. Kiely, "Novel approaches to chemical diversity."

Immunosuppressive agents: J. Luly, discussion leader

TBA, "Molecular investigations of immunophilins."

B. Parsons, "Medicinal chemistry of the immunosuppressant, FK-506."

R. Magolda, "Brequinar, a novel immunosuppressant for organ transplantation."

R. E. Morris, "Overview of the discovery, development, and clinical use of new immunosuppressive molecules: Lessons from the past strategies for the future."

New strategies for controlling hypercholesterolema and atherosclerosis: B. Roth, discussion leader

N. Watson, "The squalestatins: Potent inhibitors of squalene synthetase."

J. J. Wright, "The tocotrienols: A new class of hypolipidemic antioxidants."

P. DiCorleto, "The activated endothelium as a therapeutic target."

Advances in antipsychotic and dopamine research: M. Abou-Gharbia, discussion leader

J. Schwartz, "Dopamine receptor subtypes."

C. Tamminga, "Partial dopamine agonists as antipsychotics."

K. Svensson, "Behavioral and neurochemical models."

G. Stack, "Medicinal chemistry approaches."

The regulation of protein kinases/phosphatases in drug discovery: D. Klaubert, discussion leader

J. Dixon, "Protein tyrosine phosphatases: Their role in signal transduction and disease."

J. Stock, "Signal transducing kinases in bacteria."

TBA, "Tyrosine phosphatase in osteoblasts."

Ligand-dependent transcription factors: Opportunities for drug discovery: D. Robertson, discussion leader

R. Evans, "Emerging biology of retinoic acid receptors."

J. Katzenellenbogen, "Novel chemical probes of steroid receptors."

J. Darnell, "Modulation of transcription via interferon receptors."

TBA

Special topics: D. Triggle, discussion leader

Special topics: L. Gaeta, discussion leader

Membranes: Materials and Processes

Plymouth State College, Plymouth, NH

J. Anderson and S. Matson, co-chairs; E. Cussler, vice chair

1–6 August

Gas permeability and selectivity: J. Henis, discussion leader

L. Robeson, "Novel polymers for membrane gas separation."

H. Reiss, "Role of intermediate scale inhomogeneous stress on membrane selectivity: Conducting polymer membranes."

Inorganic membrane structures: R. Noble, discussion leader

G. Gavalas, "Chemical vapor deposition of SiO_2, TiO_2, and Al_2O_3 membrane layers on porous substrates."

Environmentally responsive transport: P. DiMilla, discussion leader

A. Hoffman, "Environmentally sensitive hydrogels as chemically selective materials."

C. Martin, "Membrane-based separations with electronically conductive polymers."

D. Hoagland, "Studying macromolecular transport in porous matrices using electrophoretic techniques."

Diffusion in porous media: G. Belfort, discussion leader

D. Prieve, "Brownian motion of a particle near surface."

J. Quinn, "Brownian diffusion of particles in confined geometrics."

J. Brady, "Hindered diffusion: Theory and simulation."

Unconventional applications: B. Eykamp, discussion leader

M. Semmens, "Waste water oxidation."

B. Scrosati, "Facilitated transport in battery separators."

R. Guy, "Skin."

Membrane separation: E. Cussler, discussion leader

TBA

TBA

Emerging processes: E. Klein, discussion leader

R. van Reis, "New developments in biopharmaceutical tangential flow filtration."

K. Boddeker, "Recovery of natural aroma species by pervaporation."

W. Ho, "Facilitated transport of olefins in polymer membranes."

Plenary: J. Anderson, discussion leader

A. Michaels, "To Thomas Graham with gratitude: Membrane technology in retrospect."

Membrane formation and characterization: J. Beasley, discussion leader

S. Pesek, "Ultrathin, defect-free gas separation membranes prepared by dry-wet phase separation."

L. Zeman, "Microvoids and macrovoids in microfiltration membranes."

R. Baltus, "Characterization of porous membranes using transport measurements."

Metal and Semiconductor Clusters

Brewster Academy, Wolfeboro, NH

M. Kappes, chair; R. Whetten, vice chair

8–13 August

Semiconductor clusters: P. Alivasatos, discussion leader

M. Bawendi, "Optical properties of II–VI semiconductor nanocrystallites."

Y. Wang, "X-ray structure and properties of Cds nanocrystals."

J. Heath, "Nanofabrication of group IVA materials."

Metal cluster complexes: P. Fantucci, discussion leader

D. Fenske, "Synthesis and structural characterization of transition metal cluster complexes."

L. Dahl, "Metal cluster complexes: Bonding and ligands."

Carbon: R. Whetten, discussion leader

D. Bethune, "Metal atoms and clusters in fullerene cages."

Y. Achiba, "Stabilities, structures, and growth mechanisms for carbon 5/6 nets."

P. Fowler, "Molecular graphs, point groups, fullerenes, and endofullerenes."

Cluster magnetics: G. Bertsch, discussion leader

R. Ziolo, "Synthesis and properties of nanocrystalline Fe_2O_3."

W. DeHeer, "Magnetic properties of iron and nickel clusters."

Transition metal clusters: P. Hackett, discussion leader

M. Knickelbein, "Optical response of transition metal clusters."

D. Salahub, "Density functional studies of transition metal microclusters."

D. Goodman, "Clusters on surfaces and catalysis."

Impact, scattering, and deposition: D. Cox, discussion leader

I. Hertel, "Fullerene beam/surface interactions."

W. Harbich, "Optical absorption of size-selected coinage metal clusters embedded in rare gas matrices."

Electron correlation: M. Broyer, discussion leader

L. Bloomfield, "Spectroscopic properties of metal-rich alkali halide cluster anions."

G. Gerber, "Femtosecond probing of sodium clusters."

V. Bonacic-Kouteckv, "Electron delocalization and optical response: Computational studies."

Imaging: U. Landman, discussion leader

S. Iijima, "Carbon nanotubes."

TBA

Cages and framework clusters: M. Kappes, discussion leader

TBA

G. Ozin, "Nanochemistry: Endo- and exosemiconductors."

W. Andreoni, "Silicon clusters: Electronic and geometric structure."

Methanogenesis

Plymouth State College, Plymouth, NH

J. Konisky, chair; G. Gottschalk, vice chair

18–23 July

Metabolism

W. B. Whitman, "Comparative studies of the pathway of branched-chain amino acid biosynthesis in *Methanococcus*."

E. DeMoll, "Intermediary metabolism of *Methanococcus vannielli*."

Assimilation of carbon

L. Daniels, "F_{420}-dependent methylene H4MPT dehydrogenase."

P. Schonheit, "Pyruvate metabolism of methanogenic bacteria."

Structural and mechanistic aspects

G. Jaun, "Structural aspects and redox chemistry of coenzyme F_{430}."

J. R. Andreesen, "Formation of acetate by glycine- and betaine-reducing anaerobic bacteria."

S. W. Ragsdale, "Mechanistic enzymology of CO_2 fixation by acetogenic bacteria using spectroscopic and presteady-state kinetic methods."

Microbial production of global gases

R. Conrad, "Microbial control of methane emission from rice fields."

R. S. Oremland, "Halomethanes: Their biodegradation and use as inhibitors in studies of trace flux."

Molecular genetics

W. M. de Vos, "Mobile DNA in thermophilic *Methanobacterium* spp."

T. Leisinger, "Genome structure and gene expression in *Methanobacterium thermoautrotrophicum* Marburg."

Gene structure and expression

M. Thomm, "Transcription factors and termination of transcription in methanogens."

J. Reeve, "Gene structure and regulation."

A. Klein, "Gene structure and expression."

Enzymes and cofactors

J. G. Ferry, "Enzymology of the fermentation of acetate."

R. K. Thauer, "Enzymes involved in CO_2 reduction in methanogenesis."

F. Mayer, "Electron microscopic studies on multienzyme complexes: Macromolecular architecture and cellular location."

Bioenergetics and membrane processes

G. Gottschalk, "Bioenergetic of methanogenic bacteria."

J. Konisky, "Membrane structure and function."

Microbial Population Biology and Ecology

Plymouth State College, Plymouth, NH

J. R. Roth, chair; R. Redfield, vice chair

25–30 July

Horizontal transfer and clonality: P. Sharp, discussion leader

R. Selander, "Estimating the magnitude of genetic exchange in bacteria."

M. Achtman, "Clonality in menigococcus."

B. Levin, "A critical look at evidence for clonality."

Biology of archaea: J. Reeve, discussion leader

F. Dolittle, "Emerging genetic systems in archaea."

F. Pfeiffer, "Genome instability."

Phage and plasmid evolution: I. Molineux, discussion leader

J. Bull, "Experimentally observed sequence evolution."

P. Reilly, "Origin and diversification of colicin operons."

S. Casjens, "Linear chromosomes and plasmids."

Horizontal transfer and clonality II: J. M. Smith, discussion leader

P. Sharp, "Sequence variation in bacillus."

C. Istock, "Genetic exchange in bacillus."

Interactions of bacteria with higher organisms: J. Shapiro, discussion leader

N. Ruby, "*Vibrio*'s and the squid light organ."

P. Kolenbrander, "Bacterial communities on teeth."

C. Cavanaugh, "Ven bacteria and their hosts."

Life in extreme environments: C. Cavanaugh, discussion leader

S. Giovanonni, "Marine organisms."

R. Kolter, "Life in stationary phase."

Genetic exchange mechanisms: G. Stewart, discussion leader

R. Redfield, "Genetic exchange within a species in the real world."

R. Hall, "Integrons and antibiotic resistance."

J. Scott, "Conjugal transposons."

Organelles and introns: T. Cavalier-Smith, discussion leader

J. Palmer, "Origins and eukaryotic organelles."

D. Shub, "Prokaryotic introns."

Health related topics: J. Davies, discussion leader

M. Nowak, "Modeling AIDS."

W. Jacobs, "The TB problem and prospects for a solution."

Molecular and Cellular Aspects of Parasitism

Colby-Sawyer College, New London, NH

D. McMahon-Pratt, chair; S. Beverley, vice chair

27 June–2 July

Cell biology of intracellular parasitism: Recognition, invasion, and intracellular survival: N. Andrews, discussion leader

G. Ward, "Origin of the parasitophorous membrane in malaria-infected erythrocytes."

R. Mortara, "*T. cruzi*/host cell interactions during invasion."

D. Sibley, "Intracellular survival of *Toxoplasma gondii*."

U. Frevert, "Malaria sporozoite liver cell receptor."

Biochemical pathways to kinetoplastids: S. Turco, discussion leader

M. Parsons, "Intracellular signal transduction in African trypanosomes."

P. Englund, "Assembly of the trypanosomal kinetoplast DNA."

B. Ullman, "HGPRTase of kinetoplastida: Paradigms for antiparasitic therapy."

Frontiers in the developmental biology of helminths: J. McKerrow, discussion leader

C. Loer, "Gut-specific gene regulation in *C. elegans* development: Parasite 'hemoglobinases'."

P. LoVerde, "Gene expression as a function of development in schistosomes."

D. Despommier, "Developmental gene expression in *Trichinella*."

J. Cordingly, "The perfect one-minute egg: Every helminth parasite's dream."

Virulence factors of parasitic protozoa: M. Pereira, discussion leader

M. Pereira, "Role of sialic acid and proteoglycans in *Trypanosoma cruzi* invasion of cells and the ECM."

D. Mosser, "Molecular aspects of *Leishmania* invasion of mammalian cells."

W. Petri, Jr., "Mechanisms of invasion by *Entamoeba histolytic*."

Molecular basis of drug action and drug resistance: T. Wellems, discussion leader

F. E. Cohen, "Structure-based drug design."

J. Schaeffer, "Molecular basis of ivermectin action."

A. F. Slater, "Heme polymerase as a target for antimalarial drugs."

D. Cioli, "Oxamniquine and hycathone: Esterification and drug response in schistosomes."

Cytokines in regulation of the immune response in helminth infections: D. Colley, discussion leader

T. Nutman, "Cytokine control of antigen-specific immune responses in human helminth infections."

E. Pearce, "Th cell responses induced by schistosome eggs."

R. Correa-Oliveira, "Cytokine and lymphocyte subset analyses in human schistosomiasis."

Insights to protozoan immunology: R. Locksley, discussion leader

R. Locksley, "CD4$^+$ subset maturation in leishmaniasis."

A. Sher, "NK cells as alternative effectors against *Toxoplasma gondii* in immunocompromised hosts."

S. Reed, "Deactivating cytokines in the establishment of *Trypanosoma cruzi* infection."

S. Hoffman, "Progress toward malarial pre-erythrocytic vaccines."

Molecular basis of vectorial competence: J. Ribeiro, discussion leader

L. Miller, "Molecular basis of vectorial competence to malaria in anopheline mosquitoes."

L. Zheng, "Genome organization in aneopheline mosquitoes."

W. Tabachnick, "Population genetics of insect vectors."

Genetic approaches to parasitic protozoa: C. Clayton, discussion leader

J. Boothroyd, "Transfection as a tool for the study of protein trafficking and gene expression in *Toxoplasma*."

P. Johnson, "Gene expression in trichomonads."

G. Cross, "Genetic approaches to surface glycoprotein function in trypanosomes."

Molecular and Genetic Basis of Cell Proliferation

Kimball Union Academy, Meriden, NH

T. Curran, chair; R. Eisenmann, vice chair

25–30 July

Development

wnt-related genes in development: A. McMahon, discussion leader

L. Parada, "Roles of proto-oncogenes in mouse development."

R. Horvitz, "Signal transduction and cell death by proto-oncogenes in *C. elegans*."

Cell death

Association of Fos with cell death: T. Curran, discussion leader

D. R. Green, "T cell differentiation and apoptosis."

C. Schneider, "A molecular dissection of growth arrest."

Cell cycle

Cyclins and cell cycle control: C. Sherr, discussion leader

E. Harlow, "Tumor suppressor genes and the cell cycle."

D. Beach, "Genetics of the cell cycle."

J. Roberts, "Control of entry into S phase."

DNA replication and repair

Regulation of DNA synthesis: P. O'Farrell, discussion leader

T. Tlysty, "Gene amplification and p53."

J. Jenkins, "p53 function."

Signal transduction I

Signal transduction by interferon: J. Darnell, discussion leader

J. Blenis, "Kinases and signal transduction."

J. Brugge, "Oncogenes and signal transduction."

A. Rao, "Activation of IL-2 expression by NFAT."

Signal transduction II

MAP kinases, *ras* and *raf*: C. Marshall, discussion leader

N. K. Tonks, "Tyrosine protein phosphatases."

F. McCormick, "Gap *rap*."

Transcription

The *myc* network: R. Eisenmann, discussion leader

D. Reinberg, "Molecular basis of transcriptional control."

R. Treisman, "Activation of SRE-mediated transcription."

M. Roussel, "Signal transduction and gene transcription."

Oncogenes and cancer I

Tumor suppressor genes: S. Friend, discussion leader

C. A. Rosen, "NFkB and oncogenesis."

P. Enrietto, "Role of *rel* in growth, differentiation, and death."

Oncogenes and cancer II

Targets of the *src* oncogene: T. Parsons, discussion leader

F. J. Rauscher III, "WT-1 tumor suppressor gene."

J. Wang, "Role of the *abl* oncogene in the nucleus."

Molecular Energy Transfer

New Hampton School, New Hampton, NH

D. S. King and J. C. Stephenson, co-chairs

20–25 June

Transition states: S. R. Leone, discussion leader

C. B. Moore, "Vibrations at unimolecular transition state."

H. Reisler, "Photodissociation of fast evolving states: From dynamics to statistics."

D. C. Clary, "Quantum reactive scattering of state-selected polyatomic molecules."

D. S. King and J. C. Stephenson, discussion leaders

Aligned reactions: P. Casavecchia, discussion leaders

C. Wittig, "State and time-resolved dynamics of reactions in complexes."

M. I. Lester, "Intermolecular dynamics in free radical complexes."

G. C. Schatz, "Theoretical studies of aligned and unaligned H + CO_2."

Scattering from surfaces: B. Kay, discussion leader

D. J. Auerbach, "Quantum state–specific surface chemical dynamics."

G. M. Nathanson, "Molecular beam studies of collisions and reactions at liquid surfaces."

Energy transfer in liquids: J. K. Rice, discussion leader

J. T. Hynes, "Vibrational relaxation for charged and polar solutes in solution."

P. F. Barbara, "The photodissociation of I_2: Medium effects on vibrational relaxation."

R. D. Levine, "Dynamics of barrier crossing in solution."

Energy transfer at solid surfaces: P. Guyot-Sionnest, discussion leader

A. L. Harris, "Surface vibrational energy flow on H/Si(111): phonons, dipoles, screening, and all that."

M. Head-Gordon, "Non-adiabatic energy exchange between molecules and metal surfaces."

Photochemistry: R. Schinke, discussion leader

P. L. Houston, "Ion-imaging measurements of molecular dynamics."

L. J. Butler, "Intramolecular electronic energy transfer and the failure of the Born-Oppenheimer approximation in competing bond fission pathways."

M. H. Alexander, "Quantum flux studies of the mechanism of molecular photofragmentation."

Vibrational state-selected chemistry: H-J. Werner, discussion leader

F. F. Crim, "Vibrational state control of biomolecular reactions."

T. R. Rizzo, "Intramolecular dynamics studied by multiple laser overtone spectroscopies."

Energy transfer at chemical energies: A. M. Wodtke, discussion leader

J. R. Barker, "Deactivation of highly excited polyatomics."

R. G. Gilbert, "Understanding features and mechanisms in energy transfer by correlating trajectory and experimental data."

G. W. Flynn, "Cool bath molecules recoiling from HOT donors: Quantum state and velocity-resolved mechanisms."

Molecular Genetics

Salve Regina University, Newport, RI

D. Cox, chair; L-C. Tsui, vice chair

1–6 August

Mapping the human genome: D. Cox, discussion leader

Cancer genetics: W. Cavenee, discussion leader

Identification of human genes in genomic DNA: M. Lovett, discussion leader

Human disease genes—mutational analysis: L-C. Tsui, discussion leader

Human mitochondrial genetics: D. Wallace, discussion leader

Genetics of common diseases: E. Lander, discussion leader

Mouse models and developmental genetics: E. Rubin, discussion leader

Gene therapy: S. Woo, discussion leader

Poster sessions will be included in the program. Applicants wishing to submit posters should indicate on the application.

Molecular Mechanisms of Microbial Adhesions

Salve Regina University, Newport, RI

R. Curtiss III, chair; E. Rosenberg, vice chair

27 June–2 July

Physical forces in adhesion

A. Zehnder, "Microbes and their activities in the interfacial environment."

M. Fletcher, "The role of substratum chemistry in bacterial adhesion."

B. E. Rittmann, "Detachment from biofilms."

H. Ridgway, "Bacterial adhesion to synthetic polymers: Mechanisms and activity of attached cells."

Genetic regulation of pathogen attachment processes

J. Mekalanos, "Regulation of colonization factor synthesis in *Vibrio cholera*."

J. van Putten, "Modulation of gonococcal entry into eukaryotic cells."

Cell adhesion mechanisms associated with mating leading to genetic transfer

A. N. Binns, "Adherence and DNA transfer by *Agrobacterium tumefaciens*."

G. Dunny, "Mating aggregation in *Enterococci*."

P. N. Lipke, "Sexual agglutination in budding yeasts."

U. Goodenough, "Mating interactions in *Chlamydomonas*."

Pathogen receptor characterization and modulation

G. Magnuson, "Synthetic fragments and analogues of the Forssman pentasaccharide for mapping of pap fimbriae receptors."

P. Falk, "*Helicobacter pylori* mucin attachment receptor."

Plant-microbe interactions: J. W. Kijne, discussion leader

J. W. Kijne, "Attachment of rhizobia to the root hairs of legumes."

J. Denarie, "Structural attributed of Nod factors synthesized by *Rhizobium meliloti* and their roles in chemical signaling."

G. Walker, "Exopolysaccharides required for nodule invasion by *Rhizobium*."

Bacterial adhesion

R. Doyle, "Cytoplasmic lectin adhesins of *Pseudomonas aeruginosa*."

P. E. Kolenbrander, "Oral streptococcal adhesins."

T. J. Trust, "*Helicobacter pylori* adhesins."

Cell surface elements as potential adhesins

R. P. Ellen, "Potential mechanisms of *Treponema denticola* adhesion."

T. J. Foster, "Fibrinectin and fibrinogen binding proteins of *Staphylococcus aureus*."

S. Normark, "Curli."

I. Ofek, "Capsules as adhesins in phagocytosis of bacteria."

Adhesion-invasion by pathogens

E. I. Tuomanen, "Activity of bacterial adhesin at the blood brain barrier."

J. Galan, "*Salmonella* adhesin and invasion."

Environmental aspects of adhesion

E. Bayer, "Cellulose and cellulosomes."

W. A. Hamilton, "Activities of cells in suspension and biofilms."

E. Z. Ron, "Petroleum bioremediation: A multiphase problem."

Molecular Membrane Biology

Proctor Academy, Andover, NH

I. Mellman, chair; L. Gierasch, vice chair

11–16 July

Protein folding in vitro and in intact cells: L. Gierasch, discussion leader

U. Hartl, "The pathway of chaperone-assisted protein folding."

C. Dobson, "Insights into protein folding via NMR."

A. Helenius, "Protein folding in the endoplasmic reticulum."

Protein translocation across membranes: P. Walter, discussion leader

L. Randall, "Role of folding and the chaperone SecB in translocation."

W. Wickner, "Reconstitution of protein translocation in bacteria."

T. Rapoport, "Membrane components involved in protein translocation across the ER membrane."

Biochemistry of intracellular membrane transport: R. Schekman, discussion leader

J. Rothman, "Budding of COP-coated vesicles."

J. Stow, "Regulation of Golgi transport by heterotrimeric G proteins."

T. Kreis, "β-COP: A coat protein essential in membrane transport through Golgi complex."

Peptide translocation across membranes: Mechanism, regulation, and function: P. Peterson, discussion leader

S. Michaelis, "Structure-function analysis of STE6, the yeast a-factor exporter."

D. Hunt, "Characterization of signal peptide association with class I MHC by tandem mass spectrometry."

Molecular sorting of proteins and membranes: I. Mellman, discussion leader

H. Pelham, "Retention of lumenal proteins in the endoplasmic reticulum."

G. Warren, "Protein retention in the Golgi appartus."

R. Klausner, "Mechanisms of transport and sorting between ER and Golgi."

New insights from developmental systems: L. Goldstein, discussion leader

P. Sternberg, "Molecular genetics of clathrin adaptor proteins in *C. elegans*."

L. Cooley, "Intercellular cytoplasm transport in *Drosophila* oogenesis."

Formation and dynamics of transport vesicles: K. Simons, discussion leader

S. Schmid, "Receptor recruitment and coated vesicle formation in vitro."

R. Anderson, "Something on endocytosis."

S. Emr, "Signal transduction complex regulates protein sorting to the yeast vacuole."

GTP binding proteins in membrane transport and membrane biogenesis: H. Bourne, discussion leader

M. Zerial, "Rab proteins and the regulation of membrane traffic in epithelial cells."

K. Wilson, "ARF and the assembly of the nuclear envelope."

P. Novick, "The role of sec4 and its accessory proteins in exocytosis."

Molten Salts and Liquid Metals

Brewster Academy, Wolfeboro, NH

J. Wilkes, chair; J. Enderby, vice chair

15–20 August

Homogeneous chemistry: R. Fehmann, discussion leader

R. Osteryoung, "Superacid chemistry in low-temperature chloroaluminate ionic liquids."

R. Carlin, "Organometallic reaction chemistry."

M. Zaworotko, "Water-tolerant low-temperature molten salts."

Structure in liquid metals: P. Verkerk, discussion leaders

D. Quitman, "Magnetic resonance studies of liquid metal alloys."

W. Geertsma, "Solid and liquid compounds with strong anion-anion interactions."

Structure in molten salts: K. Seddon, discussion leader

M. Blander, "Structure of acidic haloaluminate melts."

M. Brooker, "Raman and infrared studies of alkali metal carbonates."

R. Howe, "The structure of the molten halides."

Electric properties: K. Weil, discussion leader

W. van der Lugt, "Electrical resistivity of liquid metal alloys."

P. Edwards, "Substitutional chemistry and the metal-insulator transition."

R. Redmer, "Liquid and plasma alkali metals."

Thermodynamics: K. Todheide, discussion leader

F. Hensel, "Critical behavior of metallic liquids."

A. Pelton, "Quasichemical model of reciprocal molten salts solutions."

Electrochemistry: D. Inman, discussion leader

R. Berg, "Electrochemical deposition and dissolution of aluminum in sodium tetrachloroaluminate melts."

M. Chemia, "Electrochemical studies in potassium fluoride–hydrofluoric acid (KF-2HF) melts."

D. Sadoway, "Molten salt chemistry at temperature extremes."

Molten salt batteries: C. Hussey, discussion leader

G. Mamantov, "High-voltage sodium-sulfur battery."

D. Vissers, "High-temperature molten salt batteries."

Thermodynamics and simulations: E. Franck, discussion leader

H. Ruppersberg, "Heat capacity of liquid alloys."

G. Kahl, "Liquid state theory of binary systems."

M. Saboungi, "Network clusters in disordered materials."

Muscle: Contractile Proteins

Holderness School, Plymouth, NH

J. R. Sellers, chair; P. Vibert, vice chair

18–23 July

Crystal structures of myosin and actin: C. Cohen, discussion leader

I. Rayment, "Atomic structure of the myosin head."

C. Cohen, "Structure of the regulatory domain of scallop myosin S-1."

K. Holmes, R. Milligan, "Structure of the actin-myosin interface."

Structure-function relationships of myosin: J. Spudich, discussion leader

K. Rupple, "Mutational analysis of highly conserved regions of the myosin."

L. Sweeney, "Functional assessment of mutations in the myosin light and heavy chains."

A. Szent-Györgyi, "Light chain mutants and regulation of scallop myosin."

Biochemistry and structure of thin films: S. Hitchcock-Degregori, discussion leader

L. Tobacman, "Structure-function analysis of the thin filament as a large allosteric system."

K. Sutoh, "Charged reversion mutagenesis of *Dictyostelium* actin."

S. Hitchcock-Degregori, "Structure-function relationships in tropomyosin."

Other actin-based motors: J. Sellers, discussion leader

R. Cheney, "Characterization of myosin V (p190-calmodulin), a membrane-associated unconventional myosin from brain."

J. Albanesi, "Structure and enzymatic properties of bovine adrenal myosin I."

Dynamics of cross bridges: R. Cooke, discussion leader

Y. Goldman, "Time-resolved electron microscopy of cross-bridges in active muscle fibers."

D. Thomas, "Myosin heads attached to actin have microsecond mobility in active muscle fibers."

M. Irving, "X-ray studies of cross bridges during transients in active muscle."

H. Huxley, "Dynamic studies of cross-bridge behavior by electron microscopy and x-ray diffraction."

In vitro mechanical studies of actin and myosin: B. Simmons, discussion leader

T. Yanagida, "Force and step size of a correctly oriented myosin head."

S. Block, "Tracking down kinesin movement."

Mechanics of muscle fibers: Y. Goldman, discussion leader

V. Lombardi, "Mechanical and structural aspects of the actin-myosin."

R. Cooke, "Power stroke in the contracting muscle fiber model for the release of myosin heads during shortening."

Other contractile proteins: K. Wang, discussion leader

G. Benien, "Minititin/twitchin."

J. Trinick, "Titin/connectin: Molecular and cell biology."

K. Maruyama, "Titin/connectin: Biochemistry and physiology."

Summary

E. Taylor, T. Pollard, and H. Huxley, discussion leader

Mycotoxins and Phycotoxins

Plymouth State College, Plymouth, NH

P. Hart, chair; D. Baden, vice chair

18–23 July

P. Cotty, discussion leader

D. Anderson, "Toxic algal blooms and red tides: A global perspective."

J. Pestka, "Trichothecene-induced autoimmunity."

B. Rotter, "Interactive effects of fusarium mycotoxins."

W. Haschek-Hock, discussion leader

V. Trainer, "Toxin receptor-sites on voltage-sensitive sodium channels."

S. Hendrick, "Comparative toxicity of fumonisins."

K. Voss, "In vivo toxicological investigations of *Fusarium moniliforme* and fumonisins."

J. Wright, discussion leader

E. Cleveland, "Molecular regulation of aflatoxin biosynthesis."

V. Beasly, "Cytoskeletal alterations in hepatocytes and non-hepatocytes exposed to microcystin LR."

T. Hohn, "Molecular analysis of trichothecene biosynthesis."

W. Carmichael, discussion leader

W. Guida, "Ligands and receptors: Computational techniques for determining binding geometries."

R. Gawley, "Molecular modeling studies on the brevetoxin and ciguatoxin."

N. Keller, discussion leader

D. Lynch, "Effects of fumonisins on plant sphingolipid synthesis."

E. Moczydlowski, "Saxitoxin binding proteins."

A. Merrill, "Inhibition of sphinogolipid biosynthesis by fumonisins and structure related compounds."

R. Dickey, discussion leader

T. Yasumoto, "Structural elucidation of maitotoxin: Calcium channel agonist."

J. Apsimon, "Chemical studies on fumonisins and related compounds."

Y. Ueno, discussion leader

J. Stewart, "PSB bioassays: Automated end point versus in vitro tissue culture, mouse bioassay."

C. Mirocha, "Derivatives of fumonisins in cultures of *Fusarium* and *Alternaria*."

M. Poli, "RIA's for polyether marine toxins: Sources, sensitivity, and specificity."

S. Hall, discussion leader

F. S. Chu, "Anti-idiotype antibodies against microcystin and aflatoxin."

D. Kitts, "Cross-reacting antigens of shellfish."

R. Cole, discussion leader

P. Murphy, "Fumonsins in food's and effects of processing."

S. Galloway, "Marine biotoxins and harmful algae: A national plan."

Y. Onoue, "Chattorella brevetoxins—uniqueness of the toxins."

There will be two poster sessions—one for mycotoxins and one for phycotoxins. All attendees are encouraged to present a poster.

Natural Products

New Hampton School, New Hampton, NH

R. A. Volkmann, chair; R. L. Danheiser, vice chair

18–23 July

R. M. Coates, discussion leader

L. E. Overman, "Recent experiences in natural product total synthesis."

G. D. Berger, "Semi-synthetic studies with the zaragozic acids."

H. Yamamoto, "New synthetic methods based on organometallic reagents."

P. G. M. Wuts, discussion leader

C. N. Hodge, "De novo design of inhibitors of HIV protease."

S. L. Schreiber, "Molecular investigations of signal transduction."

S. D. Rychnovsky, discussion leader

J-E. Bäckvall, "Recent advances in organopalladium chemistry."

Y. Ito, "New carbon-silicon bond forming reactions for stereoselective organic synthesis."

M. A. Navia, "Crosslinked enzyme crystals as robust catalysts in manufacturing, biosensors, and therapeutics."

W. R. Baker, discussion leader

R. A. Lerner, "Catalytic antibodies."

R. A. Holton, "Synthesis and chemistry of taxol."

E. T. Kool, discussion leader

A. R. Chamberlin, "Synthesis of protein structure-function probes: How to trick nature into doping most of the work."

M. A. Warpehoski, "Dissecting the mechanism of DNA alkylation by CC-1065 and related analogues."

J. D. Robertus, "The structure, mechanism, and engineering of ricin, a therapeutically useful plant toxin."

P. L. Feldman, "Organic chemistry aiding basic biological research: Biosynthesis of mammalian-derived nitric oxide."

M. A. Ciufolini, discussion leader

A. R. Fersht, "Folding of barnase."

S. J. Danishefsky, "New findings in the synthesis of biologically active materials based on natural product leads."

M. E. Krafft, discussion leader

K. Mikami, "Supra-molecular chemistry in asymmetric catalytic Ene reactions."

T. S. Livinghouse, "Recent advances in the synthesis of heterocyclic natural products."

B. T. O'Neill, "Synthesis of neuropeptide antagonists."

J. J. Partridge, discussion leader

C. Djerassi, "The bittersweet pill."

R. A. Holton, discussion leader

L. L. Klein, "Chemistry and antitumor activity of 9-dihydrotaxanes."

F. E. Ziegler, "Radical approaches to synthetic problems."

Neural Plasticity

Brewster Academy, Wolfeboro, NH

M. B. Kennedy, chair; R. Murphey, vice chair

18–23 July

Conversion of short-term modulation into long-term structural changes: M. Constantine-Paton, discussion leader

M. Constantine-Paton, "Role of NMDA receptors in pruning of sensory synapses during development."

S. Hockfield, "Activity-dependent developmental regulation of molecular properties of mammalian CNS neurons."

C. Bailey, "Early steps of learning-related synaptic growth in aplysia."

M-M. Poo, "A culture model for hebbian modulation and synaptic competition."

Control of transmitter release at the molecular level: G. Augustine, discussion leader

G. Augustine, "Local control of Ca^{2+} concentration in the presynaptic terminal."

R. Jahn, "Exocytosis and membrane recycling in nerve terminals."

T. Südhof, "Neurexins: A novel class of synaptic cell surface receptors."

Modulatory influences on simple neuronal networks: E. Marder, discussion leader

D. McCormick, "Determination of state-dependent activity in thalamic and cortical systems by neuromodulators."

R. Calabrese, "Modulation of a motor pattern generator."

E. Marder, "Dynamic modulation of neurons and networks."

S. Snyder, "Gases as neuroplastic messengers."

Molecular mechanisms of receptor regulation: D. Berg, discussion leader

L. Role, "Plasticity in neuronal nicotinic ACh receptor channels."

P. Seeburg, "Glutamate-gated ion channels: Structural determinants and genetic regulation."

R. Huganir, "Regulation of neurotransmitter receptors by protein phosphorylation."

The molding of sensory systems by sensory inputs: A. Doupe, discussion leader

A. Doupe, "Song-selective auditory neurons emerge during vocal learning in the zebra finch."

E. Knudsen, "The shaping of central auditory pathways by auditory and visual experience."

S. Pallas, "Processing of developmentally induced visual inputs by auditory cortex."

Regulation of synaptic transmission by nitric oxide: D. Madison, discussion leader

J. Garthwaite, "The role of nitric oxide in the cerebellum."

S. Lipton, "Redox modulation of the NMDA receptor with nitric oxide: A two-edged sword in the CNS."

D. Madison, "Nitric oxide regulation of LTP."

The role of the amygdala: M. Davis, discussion leader

D. Rainnie, "Synaptic plasticity in the amygdala."

M. Davis, "Electrophysiological and pharmacological analysis of the amygdala related to fear conditioning."

J. McGaugh, "Role of the amygdala in integrating neuromodulatory influences on memory storage."

Adaptive regulation of gene expression in the adult nervous system: M. Greenberg, discussion leader

G. Yancopoulos, "Neurotrophic factors and how they work."

J. McNamara, "Glutamate receptor regulation of gene expression: In vivo and in vitro studies."

R. Zigmond, "Afferent and retrograde influences on peptide expression in adult neurons."

Neuroimmunology

Colby-Sawyer College, New London, NH

L. Lampson, chair

13–18 June

Regulation of the major histocompatibility complex within the CNS: L. Lampson and W. Armstrong, discussion leaders

W. Armstrong, "Current MHC overview: Distribution regulation, MHC-antigen complexing."

K. Ozato, "Molecular biology of MHC class I regulation: Special CNS mechanisms."

J. Ting, "MHC class II regulation: Special CNS mechanisms."

E. Cowan, "When is MHC up-regulation seen in the CNS? What functions are served?"

Pharmacologic control of the immune response to antigen within the CNS: B. Arnason, discussion leader

B. Arnason, "The universe of regulatory molecules: Effects of 'neurotransmitters' on lymphocytes; of 'lymphokines' on neural cells."

E. Frohman, "Immuno-regulatory molecules produced within the CNS itself."

F. Lublin, "Differential regulation in vivo: A single cytokine can have opposing effects on different cell types within the CNS."

Control of leukocyte entry and migration within the brain: D. Male, discussion leader

R. Melder, "The biophysics of leukocyte circulation: How much can it explain?"

D. Male, "Signals and adhesion molecules at the cell/brain interface: Unique to brain?"

A. Vortmeyer, "Independent control of leukocyte entry and migration through the brain."

Immune effector mechanisms that are active in the CNS: J. Antel, discussion leader

J. Sedgwick, "Antigen presentation and MHC-restricted T cell functions within the CNS."

J. Antel, "The range of cell-mediate functions: Are any unique to the CNS?"

W. Hickey, " 'Other' cells in the CNS: Mononuclear phagocytes, NK cells, mast cells, plasma cells. When do they enter and leave? What functions do they serve?"

How CNS tumors and viruses regulate their immune environment: L. Mucke, discussion leader

M. Kuppner, "How brain tumors affect their immune environment."

L. Mucke, "How viruses change their immune environment."

C. Petito, "AIDS-associated changes that can facilitate opportunistic CNS infection."

Beneficial immune responses: Effector mechanisms active against tumor and viruses within the CNS: P. Doherty, discussion leader

L. Lampson, "Anatomy of CNS immunoregulation: Importance of site within the brain, site within the tumor, and site of antigen within cell."

P. Doherty, "Effector mechanisms and target cells in CNS viral infections."

Deleterious immune responses to antigen within the CNS: R. Sobel, discussion leader

M. K. Nicholas, "Effector mechanisms in CNS graft rejection: Unique to the CNS?"

R. Sobel, "Effector mechanisms in CNS autoimmunity: Unique to the CNS?"

J. Posner, "Paraneoplastic syndromes: Potential effector mechanisms."

R. Hohlfeld, "Muscle immunobiology: How does it compare to that of the CNS?"

Equivocal and secondary immune re-

sponses in the CNS: B. Arnason, discussion leader

P. McGeer, "MHC upregulation and other signs of immune activation in 'nonimmunologic' disorders: What do they imply?"

Synthesis: General discussion and remarks by selected participants: L. Lampson, discussion leader

Selected participant, "What is unique about the immune response to antigen within the CNS?"

Selected participant, "How well can we regulate the immune response to CNS antigen?"

Selected participant, "What insights come from thinking of beneficial and deleterious CNS immune responses as two sides of the same coin?"

Applications should include citations to recent work and a poster abstract (text ≤250 words). There will be daily poster sessions; some posters may also be selected for oral presentation. According to availability of funding, small travel awards will be made to selected younger scientists.

Neurotrophins

Plymouth State College, Plymouth, NH

G. Heinrich, chair; M. V. Chao, vice chair

25–30 July

Molecular biology/structure: G. Heinrich, discussion leader

G. Yancopoulos, "Neurotrophin and receptor genes and how they work."

N. McDonald, "Neurotrophin crystal structure."

Proliferation/differentiation/regeneration: I. Black, discussion leader

R. McKay, "The interaction of growth factors with neuroepithelial stem cells."

Y-A. Barde, TBA

Cell/cell interactions: S. Landis, discussion leader

D. Anderson, "NGF receptor function in sympathoadrenal lineage."

A. Davies, "Regulation of neurotrophin responsiveness in developing sensory neurons."

H. Steller, TBA

Development/plasticity: K. Nikolics, discussion leader

C. Shatz, "Pioneer neurons and transient networks in cerebral cortical development."

F. Nottebohm, "Neuronal replacement in adult avian brain."

Signal transduction and development: M. V. Chao, discussion leader

L. Parada, "Analysis of Trk receptor family function in PC12 cells and in vivo."

T. Ebendal, "Trks in chick neuronal development."

Second messengers: G. Guroff, discussion leader

D. Kaplan, "Signal transduction by Trk receptor tyrosine kinases."

L. Cantley, "Tyrosine kinase signaling pathways."

Neuron death: R. Oppenheim, discussion leader

E. Johnson, "Programmed cell death in neurons."

M. Chalfie, "Inherited neurodegeneration in *C. elegans*."

B. Hempstead, discussion leader

Neurodegenerative disease: D. Price, discussion leader

F. Hefti, "Functions and neuroprotective actions of neurotrophins in adult brain."

F. Gage, "Regeneration in the adult nervous system."

Nonlinear Optics and Lasers

Brewster Academy, Wolfeboro, NH

D. Z. Anderson, chair; Y. Silberberg, vice chair

1–6 August

New laser sources: Y. Silberberg, discussion leader

R. Slusher, "Semiconductor microdisk lasers."

D. Hanna, "Up-conversion lasers."

Nonlinear optical effects and materials: D. Hanna, discussion leader

G. Stegeman, "A1GaAs below half-bandgap: The silicon of nonlinear optical materials."

M. Fejer, "Efficient frequency conversion in microstructured media."

Spatial-temporal dynamics in optical systems: K. Otsuka, discussion leader

W. Firth, "Spatio-temporal dynamics in nonlinear optical systems."

J. V. Moloney, "Turbulence and regular patterns in wide aperture lasers."

Soliton interactions: J. Sipe, discussion leader

G. Swartzlander, Jr., "Optical vortex solitons in nonlinear refractive media."

A. Aceves, "Soliton interactions in fiber arrays."

Atom trapping and cooling: S. Haroche, discussion leader

C. Wieman, "Optically trapped atoms—a unique and simple medium for nonlinear optics."

G. Grynberg, "The trapping of atoms in optical crystals: The quantization of motion and generated nonlinear signals."

P. Zoller, "Spectroscopy of cold atoms."

Field-induced interference: D. Bloom, discussion leader

M. O. Scully, "Field-induced atom interference effects."

D. Elliot, "Observation of interference between optical interactions."

P. Planken, "Terahertz quantum beasts in quantum wells."

High field effects: W. Knox, discussion leader

R. Falcone, "Terahertz through x-ray generation from high intensity laser interactions with gases and solids."

P. Bucksbaum, "Terahertz nonlinear excitations of Rydberg states."

P. Corkum, "Atoms and molecules in high fields."

Optical physics: S. Harris, discussion leader

B. Zel'dovich, "Spin-orbit interaction of a photon in an inhomogeneous medium and berry-chiao phase in multimode fibers."

I. Walmsley, "Nonclassical dynamics of molecular vibrational wave packets."

Nonlinear applications: D. Anderson, discussion leader

A. Renn, "Spectroscopy from single atoms to information storage."

Nuclear Chemistry

Colby-Sawyer College, New London, NH

R. V. F. Janssens, chair; G. J. Wozniak, vice chair

4–9 July

B. M. Sherrill, discussion leader

G. Bertsch, "Nuclei on the neutron drip line."

K. Riisager, "Spectroscopy at the drip lines."

J. Kiener, "Coulomb breakup experiments of astrophysical relevance."

J. P. Schiffer, discussion leader

C. Baktash, R. Casten, M. Huyse, W. Mittig, I. Tanihata, "Experiments with future radioactive beam facilities."

Recent results from the large detector arrays: P. J. Twin, discussion leader

Speakers, TBA

P-H. Heenen, discussion leader

S. Åberg, "Exotic nuclear shapes."

W. Nazarewicz, "The physics of 'identical' bands."

J. J. Gaardhoje, discussion leader

K. Snover, "Giant dipole resonance decays at moderate temperature."

R. A. Broglia, TBA

J. Stroth, "Multi-phonon giant resonances in relativistic heavy-ion collisions."

C. J. Lister, discussion leader

E. Roeckl, "Approaching ^{100}Sn in decay studies."

J. Nyberg, "In beam gamma-ray spectroscopy of nuclei near ^{100}Sn."

J. Cizewski, discussion leader

V. Janzen, "Intruder rotational bands in the A ~ 110 region."

P. Chowdhury, "Understanding unusual decays of high-K isomers."

K. Matsuyanagi, "Shell and supershell structures of reflection-asymmetric superdeformed nuclei and quantum chaos."

G. J. Wozniak, discussion leader

J. Jastrzebski, "Probing the nuclear stratosphere with antiprotons."

W. G. Harter, "From H_2O to buckyballs: Molecular rotational and symmetry."

N. Benczer-Koller, discussion leader

R. Coussement, "Quadrupole moments using level mixing spectroscopy."

R. Broda, "Complex heavy-ion reactions: Mechanisms and prospects for spectroscopy."

M. Freer, "Cluster structures in s-d shell nuclei."

Nuclear Physics

Tilton School, Tilton, NH

R. D. McKeown, chair; B. Balantekin, vice chair

25–30 July

Color transparency: G. Miller, discussion leader

R. Milner, "Color transparency and the (e,e′p) reaction."

S. Heppelmann, "Evidence for color transparency in (p,2p) reactions."

M. Strikman, "Color transparency: Recent theoretical developments."

Perturbative QCD: TBA

G. Sterman, "Hadron-nucleus collisions."

A. Mueller, TBA

Relativistic heavy ions: TBA

J. Stachel, "Results from the AGS relativistic heavy ion program."

TBA, "Results from the CERN heavy ion program."

B. Mueller, "Physics of the quark gluon plasma (theory)."

Chiral dynamics: TBA

U. Meissner, "The use of chiral perturbation theory in nuclear physics."

A. Manohar, "Baryon chiral dynamics."

Spin structure functions: R. Holt, discussion leader

TBA, Spin structure of deuterium: New results from CERN."

TBA, Spin structure of ^{3}He: New results from SLAC."

R. Jaffe, TBA

Nuclear and hadronic matter: TBA

T. Cohen, "Nucleons in nuclear matter: A QCD sum rule approach."

C. Dover, "Multi-strange hadronic matter."

Exotic hadronic matter: J. Napolitano, discussion leader

G. Franklin, "Search for a stable S = −2 dibaryon."

D. Ashery, "Search for the pentaquark."

D. Hertzog, "Exotic mesons at LEAR."

Structure functions: D. Beck, discussion leader

D. Geesaman, "Shadowing: Who knows what evil lurks?"

TBA, "Recent results from NMC."

G. Garvey, "Properties of the nucleon sea."

Nucleic Acids

New Hampton School, New Hampton, NH

K. Sprague and J. W. Szostak, co-chairs

13–18 June

RNA and DNA structures: J. Feigon, discussion leader

A. Pardi, "Solution structures of RNA."

D. Crothers, "Structure and stability of small RNAs."

D. Turner, "RNA folding and unfolding."

Recombination: S. C. West, discussion leader

G. Smith, "Unwinding and site-specific cutting of DNA by RecBCD."

C. Radding, "Triplex DNA formation by RecA protein."

D. Lilly, "Branched DNA species and their recognition by proteins."

N. Cozzarelli, "Conformations and roles of DNA catenanes."

Transcription: J. Conaway, discussion leader

S. Buratowski, "Initiation by RNA polymerases II and III."

B. Moss, "Vaccinia stage-specific transcription factors."

R. Reeder, "UBF and RNA polymerase I transcription."

L. Rothman-Denes, "DNA structure and promoter recognition."

RNP machines: C. Guthrie, discussion leader

M. Green, "Regulation of nuclear pre-mRNA processing."

B. Bass, "Structure specificity: Proteins that bind dsRNA."

H. Noller, "Role of rRNA in tRNA selection by the ribosome."

Nuclear architecture and traffic: M. Wickens, discussion leader

R. Singer, "Sequence organization and role in gene regulation."

S. Kingsman, "Control of translation by RNA handling in the nucleus."

U. Laemmli, "Relationship of chromatin domains and gene expression."

Translational control: A. Hinnebusch, discussion leader

M. Matthews, "Translational control by an RNA-regulated protein kinase."

D. Draper, "How ribosomes, tRNA, and repressor flip an mRNA switch."

D. Ish-Horowicz, "Intracellular transcript localization in *Drosophila* embryos."

M. Wickens, "Poly(A) addition and removal during early development."

Nucleic acids with modified backbones: S. A. Benner, discussion leader

M. Egholm, "Peptido-oligonucleotide analogs."

C. Leumann, "Bicyclo-oligonucleotide analogs."

J. van Boom, "Methylene-bridged oligonucleotide analogs."

M. Matteucci, "Phosphate modifications of oligonucleotides."

Protein-nuclei acid interactions: A. D. Frankel, discussion leader

J. Williamson, "Study of RNA-protein interactions by NMR."

T. Ellenberger, "DNA recognition by basic α-helics."

S. Burley, "X-ray studies of eukaryotic transcription factors."

K. Nagai, "RNA-protein interactions in snRNPs."

The RNA world: M. J. Yarus, discussion leader

D. Bartel, "Isolation of new ribozymes from random sequences."

P. Perlman, "Analysis of domain 5 of a group II intron."

Organic Photochemistry

Salve Regina University, Newport, RI

R. A. Caldwell, chair; F. D. Saeva, vice chair

25–30 July

A. G. Schultz, "Photorearrangements in organic synthesis."

P. F. Barbara, "Ultrafast studies of intermolecular electron transfer."

TBA

J. Warman, "Photoinduced intramolecular change separation and non Franck-Condon processes studied by time-resolved microwave conductivity."

C-H. Tung, "Application of hydrophobic and lipophobic interactions to photochemical synthesis of large-ring compounds."

N. C. Yang, "The role of ground-state complexation in photochemical electron transfer."

K. Schaffner, "The first events of the complex 'cis-trans photoisomerization' in phytochrome."

TBA

D. Holten, "Ultrafast studies of the photosynthetic reaction center."

M. Irie, "Photochromism of diarylethenes with heterocyclic rings—thermally irreversible and fatigue resistance photoreaction."

K. Mizuno, "Photochemistry of vinylidenecyclopropanes."

D. W. Pratt, "Photochemistry at 1-MHz resolution in the UV."

TBA

M. D. E. Forbes, "Time-resolved EPR studies of radicals, biradicals, and spin-correlated radical pairs."

TBA

P. J. Wagner, "How does electron spin density influence rate constants for the reactions of excited triplets?"

R. Wilbrandt, "Structures of short-lived photochemical intermediates by time-resolved resonance Raman spectroscopy."

TBA

R. P. Johnson, "Photorearrangements of conjugated enzymes."

H. Tomioka, "Reactions of carbenes and nitrenes in noble gas matrix."

TBA

Abstracts should be submitted to the Chair, Richard A. Caldwell, Department of Chemistry, University of Texas, Dallas, P.O. Box 830688, Richardson, TX 75083–0688, prior to 1 June 1993, with preference for oral or poster presentation stated.

Organic Reactions and Processes

New Hampton School, New Hampton, NH

E. J. J. Grabowski, chair; J. M. Takacs, vice chair

11–16 July

S. E. Denmark, "New vistas in organoelement chemistry."

K. Koga, "Chiral lithium amides: Design, synthesis, and reactions."

P. Pitchen, "Multi-kilo scale asymmetric synthesis."

R. E. Ireland, "Methodology in the context of natural product synthesis."

J. Mattay, "Radical ions in organic synthesis: Applications to cycloadditions and cyclizations."

J. Y. Chung, "Practical synthesis of fibrinogen receptor antagonists."

D. A. Tomalia, "Starburst™/cascade dendrimers: Fundamental building blocks for a new nanoscopic chemistry set."

J. Rebek, "Recognition and replication in model systems."

J-L. Luche, "Some of the multiple facets of sonochemistry: From organic synthesis to tribochemistry."

D. P. Curran, "Recent applications of radical reactions in organic synthesis."

J. Kant, "Approaches to 3-substituted cephalosporins using organicuprate chemistry."

H. U. Reissig, "1,2-oxazines as tools for organic synthesis."

M. C. Desai, "Structure driven strategy: Discovery of potent substance P antagonists."

K. Sato, "Novel functionalized heterocycles for use in new color imaging systems."

K. B. Sharpless, "Recent advances in asymmetric catalysis."

A. Charette, "Recent developments in the design of new chiral auxiliaries for hydroxyl-directed reactions."

G. Matcham, "Practical biocatalysis: High purity chiral amines via transamination."

S. Pederson, "New applications of the pinacol coupling reaction."

J. P. Dinnocenzo, "Cation radical explorations."

E. J. J. Grabowski, "New insights into the mechanism of the anionic oxy-cope rearrangement."

L. van Zelst, "Current issues in museum conservation."

V. Rawal, "Applications of strained-ring compounds in synthesis."

R. DiCosimo, "Biocatalytic production of glyoxylic acid."

H. Takaya, "Highly enantioselective hydroformylations catalyzed by new chiral Rh(I) complexes."

M. E. Krafft, "Organic reactions using transition metals."

J. Westermann, "Transition metal–catalyzed conjugate addition of organoaluminium compounds."

Organometallic Chemistry

Salve Regina University, Newport, RI

I. T. Horváth and H. W. Turner, co-chairs; R. P. Hughes, vice chair

11–16 July

P. T. Wolczanski, discussion leader

T. D. Tilley, "Design, synthesis, and chemistry of reactive transition metal-silicon bonds."

H. H. Brintzinger, "Do chiral metallocenes defy the catalyst uncertainty principle?"

K. R. Dunbar, "New applications of nitrile and ether ligands to the organometallic chemistry of low-valent transition metal complexes."

E. E. Bunel, "The characterization and reactivity of HRh $(CO)_2I_2$, $[HRh(CO)_2I_3]^-$ and the mechanism of the Rh-catalyzed carbonylation of alcohols."

K. G. Moloy, discussion leader

J. L. Hubbard, "Small molecule binding and activation by electrophilic Ru-nitrosyl organometallics."

J. T. Groves, "Metalloporphyrins in organized arrays and ensembles."

M. Bochmann, "Group IV metal alkyl cations: Ultimate catalysts."

L. Marko, discussion leader

J. Halpern, "Some mechanistic aspects of binuclear oxidative addition-reductive elimination reactions."

R. A. Periana, "Asymmetric hydroformylation of vinylarenes."

S. L. Buchwald, "Organic synthesis using early transition metal complexes."

N. M. Doherty, discussion leader

C. A. Reed, "New weakly coordinating anions."

R. D. Adams, "The synthesis, structures, and unusual reactivity of mixed-metal cluster complexes containing platinum and ruthenium or osmium."

I. P. Rothwell, "Arene hydrogenation catalyzed by group 5 metal derivatives."

R. A. Andersen, discussion leader

G. Consiglio, "Olefin-carbonmonoxide-copolymers: Old and new problems for an insertion polymerization."

G. Bertrand, "New stable free carbenes and new types of phosphorus cations."

J. Feldman, "New catalysts for acyclic functionalized olefin methathesis."

C. P. Kubiak, discussion leader

E. Carmona, "C-H bond activation reactions of olefins and other organic substrates by iridium complexes."

D. M. P. Mingos, "Applications of microwaves in organometallic and inorganic syntheses."

M. E. Wright, "Scope, mechanism, and synthetic utility for the rhodium catalyzed silaformylation of carbonyl compounds."

R. T. Baker, discussion leader

A. K. Rappé, "The importance of nonbonded interactions in polymerization catalysis."

J. A. Gladysz, "New chemistry from 'old' ligands: Synthesis and reactivity of unusual carbon (C_x) and imine complexes."

C. J. Burns, "Novel high-valent organoactinide chemistry."

R. G. Bergman, discussion leader

W. A. Herrmann, "Organic metal oxides: New catalysts in olefin chemistry, new precursors of oxidic materials."

M. S. Brookhart, "Catalytic transformations using electrophilic organometallic complexes."

G. Parkin, discussion leader

A. Sen, "New approaches to catalytic C-H activation."

L. K. Woo, "Stereoselective carbon-carbon bond forming reactions catalyzed by metalloporphyrins."

R. L. Halterman, "Asymmetric catalysis with chiral bridged metallocenes."

Origins of Solar Systems

Colby-Sawyer College, New London, NH

J. A. Wood, chair; S. E. Strom, vice chair

4–9 July

Interstellar and interplanetary dust: D. E. Brownlee, discussion leader

A. Tielens, "Interstellar dust."

S. A. Sandford, "Interplanetary dust."

Nebular processes and products: E. H. Levy, discussion leader

R. H. Jones, "Chondrites: Evidence of thermal processing of planetary material in the solar nebula."

S. A. Balbus, "Effects of rotation and shear in the solar nebula."

Gas in preplanetary disks: A. I. Sargent, discussion leader

S. V. W. Beckwith, "Disks associated with young stellar objects."

L. W. Hartmann, "Winds associated with protostellar disks."

Origin of planetary atmospheres: D. M. Hunten, discussion leader

J. Pollack, "Origin of the Jovian planets."

R. O. Pepin, "Noble gases as tracers of atmospheric origin and evolution."

Nebular time scales: F. A. Podosek, discussion leader

M. F. Skrutskie, "On the lifetime of protostellar disks."

G. J. Wasserburg, "Chronometry of the earliest stages of planet formation in the solar system."

Volatiles in the early solar system: C. F. Chyba, discussion leader

M. F. A'Hearn, "Comets as a source of planetary volatile."

M. H. Carr, "Volatiles on mars: Sources, sinks, and processes."

Nebular chemistry: G. A. Blake, discussion leader

E. F. van Dischoeck, "Chemistry in protostellar disks."

J. S. Lewis, "Chemistry in the solar nebula."

The origin of life: C. Sagan, discussion leader

W. M. Irvine, "Interstellar molecules: Precursors of carbon chemistry in the solar nebula."

C. McKay, "Planetary evolution and the origin of life."

Origin of planetary rotation: G. W. Wetherill, discussion leader

J. J. Lissauer, "Systematic accretion and planetary rotation."

A. G. W. Cameron, "Giant impacts and planetary rotation."

Phagocytes

Plymouth State College, Plymouth, NH

C. Nathan, chair; R. B. Johnston, Jr., vice chair

4–9 July

J. Schlessinger, Signal transduction: Kinases and phosphatases."

Gene regulation in phagocytes: A. Ezekowitz, discussion leader

J. Ravetch, "Fc receptors."

S. Orkin, "Oxidase components."

P. Baeuerle, "Oxidative regulation of gene expression."

J. B. Weinberg, "Induction of differentiation by nitric oxide."

Small G proteins: A. Gesaitis and M. Quinn, discussion leaders

A. Hall, "Small GTPases and cytoskeletal organization."

G. Bokoch, "Small G proteins and isoprenoids in the oxidase."

Seven transmembrane domain receptors: M. Baggiolini, discussion leader

P. Murphy, "MIP-1α/RANTES receptor."

C. Gerard, "C5a receptor."

F. Boulay, "FMLP receptor."

K. Moore, "IL-10 receptor."

Kinases and phosphatases: L. MacPhail, discussion leader

M. Fuortes, "Protein tyrosine kinases."

S. Grinstein, "Protein phosphatases."

Leukocyte adhesion: L. Osborn, discussion leader

S. Wright, "Modulation of adhesion receptor function."

D. Wagner, "P-selectin knock-out mice."

L. Phillips, "Leukocyte adhesion deficiency type II."

S. Haskill, "Adhesion-dependent gene expression."

Leukocyte transmigration: S. Gordon, discussion leader

B. Muller, "Monocyte-endothelial transmigration."

S. Silverstein, "Leukocyte-endothelial transmigration."

Cytoskeletal interactions: G. Omann, discussion leader

A. Ding, "LPS and the cytoskeleton."

W. Nauseef, "Oxidase and the cytoskeleton."

D. Portnoy, "*Listeria* and the cytoskeleton."

T. Stossel, "Second messengers and the cytoskeleton."

Host-microbe encounters: R. Johnston, Jr., discussion leader

L. Riley, "*M. tuberculosis* invasin."

P. Sansonetti, "*Shigella*-induced apoptosis."

K. Joiner, "Parasitophorous vacuole."

Therapeutic approaches: S. Kelbanoff, discussion leader

R. Mumford, "Inhibitors of phagocyte serine proteases."

S. Watson, "Adhesion receptor chimeras."

S. Reed, "Cytokines and anti-cytokines in protozoal infections."

H. Malech, "Gene therapy of chronic granulomatous disease."

Photosynthesis: Biochemical Aspects of

New Hampton School, New Hampton, NH

B. Diner, chair; M. Thurnauer, vice chair

1–6 August

M. Thurnauer, session chairPhotosystem I reaction center: J. Biggins and R. Malkin, discussion leaders

P. Fromme, "Crystallographic and three-dimensional structure of photosystem I at 6 Å resolution."

J. Golbeck, "Biophysical characterization of site-directed mutants in which Fx, FB, and FA are changed to [3Fe-$S] clusters."

K. Brettel, "Electron transfer in photosystem I."

P. Joliot, session chair

Secondary electron transfer, membrane energetics, and ATPase: J. B. Jackson and D. Knaff, discussion leaders

D. Bryant, "Alternative pathways for electron transfer in cyanobacteria."

W. Nitschke, "Cytochrome bc complexes involved in menaquinone oxidation."

L. Dutton, session chair

Cytochrome bc1 and bf complexes: W. Cramer and F. Daldal, discussion leaders

D. Robertson, "Design, synthesis and characterization of a two-heme cytochrome b."

A. Crofts, "Site-directed mutants of the cytochrome bc1 complex."

F-A. Wollman, "Study of the assembly of the cytochrome b6/f complex of *Chlamydomonas reinhardtii* using genetic transformation."

J. Amesz, session chair

Reaction centers of the green and heliobacteria: R. Feick and N. Nelson, discussion leaders

R. Blankenship, "Reactions from *Heliobacteria* as models for photosystem I."

H. Scheller, "Structure and function of *Chlorobium* reaction centers."

C. Yocum, session chair

Photosystem II reaction center and oxygen evolution: G. Brudvig and A. W. Rutherford, discussions leaders

T. Bricker, "Protein-protein interactions in photosystem II."

R. Debus, "Amino acid residues that influence the stability or operation of the manganese complex of photosystem II."

T-a. Ono, "The manganese cluster and calcium of the photosynthetic oxygen-evolving enzyme."

R. Cogdell, session chair

Light-harvesting antenna complexes: H. Sheer and G. Schmidt, discussion leaders

W. Kuhlbrandt, "A partial atomic model of plant light-harvesting complex."

N. Hunter, "The use of site-directed mutagenesis to investigate *Rhodobacter sphaeroides* light-harvesting complexes."

D. Tiede, session chair

Purple photosynthetic bacterial reaction centers—protons uptake and primary and secondary electron transfer: M. Okamura and C. Wraight, discussion leaders

N. Woodbury, "Mechanism of electron transfer in purple bacteria using femtosecond spectroscopy in mutant and wild-type reaction centers."

W. Mäntele, "Infrared studies of protolytic reactions and proton dynamics upon Q_A and Q_B reduction in bacterial reaction centers."

M. Gunner, "How membrane proteins stabilize buried charges: Lessons from the reaction center structure."

G. Babcock, session leader

Historical retrospective

J. Myers, "Tribute to a 60-year-old experiment."

G. Cheniae, session chair

Highlights of the poster presentations

TBA

B. Marrs, session chair

Regulation of gene expression and protein import: A. Grossman and R. Nechushtai, discussion leaders

P. Weisbeek, "Protein targeting into chloroplasts."

S. Golden, "Regulation of light-responsive photosystem II genes in synechococcus."

C. Bauer, "Regulation of light harvesting and reaction center gene expression in *R. capsulatus*."

Physical Metallurgy

Plymouth State College, Plymouth, NH

J. B. Cohen and G. B. Olson, cochairs; R. P. Gangloff, vice chair

1–6 August

Materials by design

Design principles: M. Hillert, discussion leader

G. B. Olson, "Systems design of materials: Application to steels."

J. D. Embury, "Design of multifunctional materials: High strength/high conductivity."

A. S. Argon, "Structural objectives in design of materials."

Property-performance relations: A. Rosenstein, discussion leader

H. Shercliffe, "Property objectives and modeling for design."

Modeling tools: L. Kaufman, discussion leader

B. Sundman, "Modeling for a general thermodynamic database."

J. Sanchez, "Statistical thermodynamics of alloys: From enlighted phenomenology to first principles."

A. J. Freeman, "FLAPW calculation of phase stability."

B. Harmon, "Total energy calculations of structural phase stability and material properties."

Total energy calculations: D. Laughlin, discussion leader

D. Pettifor, "Electron theory in alloy design."

M. Stocks, "Total energy calculations for materials design."

M. Eberhart, "Calculations of elastic constants."

Modeling tools—dynamics: J. Perepezko, discussion leader

J. Agren, "Software tools in materials design."

R. Wagner, "Numerical modeling of percipitation."

P. Voorhees, "Coherency and multicomponent effects in coarsening."

B. London, "Design for processability of advanced cast intermetallics."

Dynamics—continued: G. Yoder, discussion leader

M. P. Anderson, "Computational methods in predicting the structure and properties of multiphase materials."

D. Dimiduk, "Atomistic modeling of solution hardening in intermetallics."

D. Parks, "Transformation plasticity modeling and application to toughness."

Interface design: C. J. McMahon, Jr., discussion leader

V. Tvergaard, "Interface mechanics and materials design."

R. Carpenter, "Nanochemistry and structure of interfaces."

N. Eustathopoulos, "Physiocochemistry of interfaces in materials design."

W. Flowers, "Design."

Design examples: R. Doherty, discussion leader

A. P. Miodownik, "The role of thermodynamics in alloy design."

J. S. Kirkaldy, "Thermodynamic and kinetic models for microstructure and mechanical property prediction for steel."

N. Saunders, "Thermodynamic design of alloys."

H. K. D. H. Bhadeshia, "Materials design for weldability."

Physical Organic Chemistry

Holderness School, Plymouth, NH

C. J. Burrows, chair; P. Dowd, vice chair

20–25 June

Etter memorial in solid-state chemistry: M. W. Baum, discussion leader

M. D. Ward, "Growth molecular crystals at molecular interfaces."

M. D. Hollingsworth, "Functional group recognition in channel inclusion compounds."

J. J. Dannenberg, "MO studies of cooperativity and crystal nucleation."

Etter memorial in molecular recognition: J. M. McBride, discussion leader

T. W. Bell, "Controlled molecular architecture in designed complexation."

J. M. Lehn, "Advances in supramolecular chemistry."

Reactive intermediates: M. K. Boyd, discussion leader

K. S. Peters, "Picosecond dynamics of radical ion pairs formed in stilbene photocycloaddition reactions."

J. B. Lambert, "New anions for silyl cations."

S. R. Kass, "Reactive intermediates via gas phase ion-molecule investigations."

Polymers and materials: R. D. McCullough, discussion leader

J. M. Tour, "Synthesis of conjugated oligomers for electronic, photonic, and high-performance material applications."

Y. H. Kim, "Controversy in living cationic polymerization mechanism."

J. E. Jackson, "The ion-binding approach to organic magnetic materials."

Enzymes: P. Dowd, discussion leader

J. Rétey, "How do enzymes manipulate physical organic chemistry?"

L. L. Frye, "Inhibitors of sterol biosynthesis."

R. B. Silverman, "Mechanisms of reactions catalyzed by monoamine oxidase."

Nucleic acids: M. M. Greenberg, discussion leader

E. T. Kool, "Dynamic behavior in multifunctional synthetic receptors for nucleic acids."

D. E. Falvey, "Mechanistic aspects of enzymatic photorepair of DNA."

Organometallics: A. R. Pinhas, discussion leader

R. D. Johnson, "Metallofullerenes: Metal clusters in a carbon cage."

R. G. Bergman, "Use of organotransition metal complexes in the formation and cleavage of carbon-hydrogen and carbon-heteroatom bonds in organic molecules."

A. A. Dembeck, "Organometallic modification approach to control of polymer properties."

Short talks: C. J. Burrows, discussion leader

Stereochemistry and mechanism: F. W. Fowler, discussion leader

J. S. Siegel, "Stereochemistry of nanomolecules."

J. E. Baldwin, "Stereochemistry and mechanism of the thermal isomerization of vinylcyclopropane to cyclopentene."

D. S. Kemp, "Thiol capture—a mechanism-based approach to peptide synthesis.

Poster titles should be sent to C. Burrows, University of New York at Stony Brook, Stony Brook, NY 11794–3400, by 1 June 1993.

Plant and Fungal Cytoskeleton

Proctor Academy, Andover, NH

D. E. Fosket, chair; S. M. Wick, vice chair

18–23 July

Molecular and cellular analysis of microtubule-associated proteins and MTOCs: D. E. Fosket, discussion leader

B. R. Oakley, Gamma-tubulin and mitotic spindle organization in *Aspergillus*."

B. A. Palevitz, "Gamma-tubulin is associated with all angiosperm MT arrays."

S. M. Wick, "Identification of MAPs and gamma-tubulin from *Arabidopsis*."

Y. Mineyuki, "Formation and function of the preprophase band."

Molecular-genetic identification of the components of the microtubule cytoskeleton: R. Meagher, discussion leader

C. D. Silflow, "Genetic analysis of the *chlamy* microtubule cytoskeleton."

D. P. Snustad, "Limited expression of tubulin genes: Specialized tubulins?"

G. Barnes, "Isolation, characterization, and cloning of MAPs from yeasts."

Molecular analysis of motility and microtubule motor protein: S. M. Wick, discussion leader

N. R. Morris, "Mechanism of nuclear migration in *Aspergillus*."

M. E. Porter, "*Chlamydomonas* flagellar dynein."

T. Asada, "A phragmoplast microtubule motor in plant cytokinesis."

W. Z. Cande, "Mitotic spindle motors in diatoms."

Molecular characterization of microtubule proteins: A-M. Lambert, discussion leader

M. Vantard, "MAPs and MTOCs in higher plants."

C. Bokros, "The MAP binding region of the plant tubulin regulatory domain."

K. Gull, "Molecular analysis of fungal and trypanosome cytoskeletons."

Molecular and cellular analysis of the actin cytoskeleton and its components: N. R. Morris, discussion leader

R. Meagher, "Actin genes and their expression in *Arabidopsis*."

C. Staiger, "The profilin multigene family in maize."

D. Drubin, "Actin and actin-binding proteins in the yeast cytoskeleton."

E. Yokota, "Biochemical and biophysical characterization of plant myosin."

Molecular and cellular analysis of cell cycle progression: A. Bajer, discussion leader

T. W. Jacobs, "P34^{cdc2} kinase and cell cycle progression."

G. S. May, "Control of mitosis in *Aspergillus*."

L. C. Morejohn, "Evidence for check point controls in plant mitosis."

S. M. Wolniak, "Signals controlling entry into anaphase."

Cyclins, P34^{csc2} kinase, and the regulation of IF assembly during the cell cycle: M. J. Saunders, discussion leader

J. S. Hyams, "Yeast cytoskeleton modification during cell cycle progression."

P. J. Shaw, "Cell-cycle–dependent changes in protein phosphorylation."

S. J. Roux, "Nuclear intermediate filament proteins and their assembly."

M. J. Saunders, "Lamin filament disassembly and reassemble in mitosis."

Cellular analysis of formation of cytoskeleton arrays their and function: P. K. Hepler, discussion leader

R. Wayne, "Gravity perception involves the PM-extracellular matrix junction."

P. K. Hepler, "Calcium regulation of the actin cytoskeleton in pollen tubes."

R. J. Cyr, "Calcium regulates microtubule stability in angiosperm cells."

Interactions of the cytoskeleton with cellular components: J. S. Hyams, discussion leader

E. Davies, "The association of polyribosomes with the cytoskeleton."

E. Smiranova, "Microtubules and the polarization of plant cells."

K. M. Warpeha, "An IF protein participates in blue light signal transduction."

R. Williamson, "Analysis of *Arabidopsis* cell shape mutants."

Plant Cell and Tissue Culture

Brewster Academy, Wolfeboro, NH

P. Maliga, chair; R. Jorgensen, vice chair

13–18 June

Plant transgene

Novel methods—new systems: P. Maliga, discussion leader

P. Maliga, "Plastid engineering."

I. Vasil, "The molecular genetic manipulation of wheat."

K. D'Halluin, "Transgenic maize plants by tissue electroporation."

W. Thompson, "The effect of nuclear scaffold attachment regions on transgene expression."

Gene tagging I

K. Feldman, "Gene tagging by T-DNA insertions using seed mutagenesis."

C. Koncz, "Genetic disruption, activation, and modification of differentiation processes by T-DNA insertion mutagenesis."

Gene tagging II: N. Fedoroff, discussion leader

N. Fedoroff, "An enhancer/promoter-tagging system for *Arabidopsis* based on the Ac transposable element."

G. Cardon, "The transposable element En/Spm of *Zea mays L.* as tool for gene tagging in heterologous species."

B. Baker, "Ac/Ds insertion-deletion mutagenesis in *Arabiodopsis*."

J. Jones, "The maize Ac:Ds system in heterologous plants: a tool for gene tagging."

E. Selker, "Control and function of DNA methylation in *Neurospora*."

W. R. Engels, "Sequence requirements for *Drosophila* P-induced gene replacement."

Gene targeting/heterologous recombination systems: E. Signer, discussion leader

E. Signer, "Homologous plant and heterologous yeast systems in gene targeting."

D. Ow, "Chromosome engineering via cre/lox–mediated recombination."

J. Paszkowski, "Homologous gene replacement in plants."

R. Offringa, "Gene targeting in plants using the *Agrobacterium* vector system."

Epimutation, paramutation, and DNA methylation: J. Messing, discussion leader

J. Messing, "Site-specific DNA modifications during maize development."

J. Kermicle, "Gene duplication and R-locus paramutation."

R. Martienssen, "Developmental regulation of transposon methylation in maize."

E. Richards, "DNA methylation mutants in *Arabidopsis*."

Transgene/transgene interactions, endogenous gene silencing by transgenes: R. Jorgensen, discussion leader

R. Jorgensen, "Inheritance and developmental induction of genomic iomprints in transgenic plants."

J. Mol, "Post-transcriptional interaction between homologous flower pigmentation genes: Is antisense RNA involved?"

M. Matzke, "Epistatic interactions between partially homologous transgenes in plants."

A. Depicker, "Transgene/transgene interactions, endogenous gene silencing by transgenes."

Broadening the host-range of *Agrobacterium* vectors

G. Nester, "DNA transfer into monocots by *Agrobacterium*."

B. Hohn, "*Agrobacterium*-mediated gene transfer to maize."

Designer crops—engineering of metabolic pathways: L. Wilmitzer, discussion leader

L. Wilmitzer, "Molecular approaches to influence photoassimilate partitioning and allocation in higher plants."

T. Voelker, "Of oils and fats: Genetic engineering for modified plant storage lipids."

J. Ryals, "Genetic engineering of fungal disease resistance."

E. Cornish, "Genetic manipulation of flavonoid biosynthesis."

Plant Molecular Biology

Proctor Academy, Andover, NH

W. R. Briggs, chair; V. L. Chandler, vice chair

4–9 July

Hormones I

T. Lomax, "Auxin-binding proteins."

R. Hedrich, "Auxin regulation of channel activity."

G. Hagen, "Auxin-regulated gene expression."

A. Theologis, "Early auxin regulated expression."

Hormones II

M. A. Estelle, "Characterization of an auxin resistance gene."

J. R. Ecker, "Genes controlling ethylene signal transduction in *Arabidopsis*."

D. F. Klessig, "Induction, modification, and reception of the salicyclic acid signal in disease resistance responses."

P. Staswick, "Jasmonate, genes, and fragrant signals."

Membrane transport I

H. Sze, "Vacuolar proton-transporting ATPases."

J. F. Harper, "Plasma-membrane H+-ATPases in *Arabidopsis*."

P. Hasegawa, "ATPase gene expression during slat stress."

W. B. Frommer, "Structure, function, and regulation of sucrose and amino acid transporters from the plasma membrane."

Membrane transport II

N. Sauer, "Sugar transporters from the plasma membrane."

N. M. Crawford, "Analysis of a nitrate transporter and gene cell from *Arabidopsis*."

P. Thuleau, "Reconstitution of a calcium-permeable ion channels."

C. Zeilinger, "Reconstitution of a potassium-permeable ion channel."

Second messengers

L. S. Kaufman, "A blue light–regulated G-protein system."

H. Ma, "*Arabidopsis* G-protein gene expression."

K-i. Shimizaki, "Blue light–dependent proton pumping by guard cells."

S. M. Assmann, "Signal transduction in stomatal movement."

Light I

R. Hangarter, "Using mutants to unravel blue light signal transduction."

J. Palmer, Protein phosphorylation in phototropism."

W. R. Briggs, "Intermediate filaments in blue light signal transduction."

A. Cashmore, "An *Arabidopsis* mutant defective in blue light–mediated photomorphogenesis."

Light II

H. Smith, "Molecular ecophysiology of phytochrome."

T. Gatenby, "Chaperonin and phytochrome conformation."

J. Silverthorne, "Phytochrome in nonflowering vascular plants."

E. Schäfer, "Photocontrol of chalcone synthase: A model system for the analysis of signal transduction."

P. Quail, "Phytochrome and its genes."

Plant-pathogen signal transduction

M. G. Hahn, "Characterization of an elicitor receptor."

J. Ebel, "Elicitor-signal perception and transduction."

J. Dangl, "Disease-resistance genes."

C. J. Lamb, "Molecular communication in plant defense."

Polyamines

Colby-Sawyer College, New London, NH

G. D. Luk and O. Heby, co-chairs; I. Scheffler and A. Fairlamb, co-vice chairs

20–25 June

Molecular interactions

H. Basu, "Chromatin condensation."

B. Frydman, "tRNA binding."

R. Davis, "Polyamine pools."

Physiologic functions

S. Orrenius, "Regulation of apoptosis."

P. Molinoff, "NMDA receptors."

Gene expression

A. Pajunen, "Regulation of 2 adoMetDC genes."

O. Janne, "Hormonal regulation of AdoMetDC gene."

D. Morris, "Translational regulation of AdoMetDC."

Prokaryotes

C. Tabor, "Yeast genetics."

R. Malmberg, "Arginine decarboxylase in plants."

Potential clinical utility

U. Regenass, "AdoMetDC inhibitor."

R. Snyder, "Radiation protection."

R. Bergeron, "Directed synthesis for clinical utility."

Functional analysis

H. Dowling, "Intestinal growth."

A. Shirahata, "Polyamine analogs."

Regulatory mechanisms

M. Haddox, "Post-translational modification of ODC."

K. Igarashi, "Polyamine transport."

L. Alhonen, "Transgenic animals."

Historical perspectives

E. Herbst, "A history of polyamine research."

V. Zappia, "MTA phosphorylase as a marker of an antioncogene."

Regulation and function

S. Hayashi, "ODC antizyme."

P. Coffino, "ODC degradation."

E. Holtta, "ODC as an oncogene."

Polymer Colloids

Tilton School, Tilton, NH

D. R. Bassett, chair; T. G. M. van de Ven, vice chair

27 June–2 July

D. R. Bassett, discussion leader

R. G. Gilbert, "The effect of aqueous-phase kinetics on particle growth and secondary particle formation in polymer colloids."

H. H. Tobita, "Kinetics of branching and crosslinking in emulsion polymerization."

R. M. Fitch, discussion leader

R. Pelton, "Network flocculation of polystyrene latex: Fact or fancy?"

D. D. Heymans, "Branched vinyl esters in emulsion polymerization."

I. M. Krieger, discussion leader

R. D. Jenkins, "Design and rheology of novel highly efficient associative polymers."

D. Ou-Yang, "Kinetics of associative polymer adsorption on colloidal surfaces."

F. Candau, "Hydrophobically modified polyacrylamides and their interaction with surfactants."

R. Pelton, discussion leader

R. H. Ottewill, "Scattering studies on association polymers."

M. S. Wolfe, "Structure and rheology of swellable microgels."

P. R. Sperry, discussion leader

D. H. Napper, "The deposition of sterically stabilized polymer colloids."

M. A. Winnik, "Molecular aspects of latex film formation."

B. B. Snyder, "Examination of the role of water in latex film formation

M. M. Santore, discussion leader

C. C. Pichot, "Adsorption studies of polynucleotides-based latexes."

M. M. Rutland, "A surface force study of the adsorption of $C_{12}E_5$ to surfaces using the atomic force microscope and surface force apparatus."

D. Sundberg, discussion leader

M. S. El-Aasser, "The morphology of structured latex particles."

A. L. German, "Reactive latexes."

K. Schätzel, "Electrophoretic mobility and particle size measured by laser light scattering."

T. G. M. van de Ven, discussion leader

J. M. Asua, "Emulsion polymerization in a continuous loop reactor."

T. F. Tadros, "Preparation of microlatex dispersions using oil-in-water microemulsions."

Polymers

New England College, Henniker, NH

R. M. Ottenbrite, chair; M. E. Galvin, vice chair

27 June–2 July

E. E. Paschke, discussion leader

H. Ringsdorf, TBA

J. L. Benham, "Novel branched block polymers."

E. Pearce, discussion leader

C. G. Wilson, "Recent advances in organic imaging systems."

R. Guadiana, discussion leader

R. A. Waymouth, "Stereo-specific and enantioselective polymerization with well-defined catalysts."

M. Green, "Macromolecular and supramolecular chiral arrangements and discriminations."

M. Jaffe, discussion leader

J. M. DeSimone, "Homogeneous and heterogeneous polymerizations in supercritical carbon dioxide."

J. W. Connell, "Synthesis and characterization of atomic oxygen resistant polymers."

H. Jabloner, discussion leader

S. Sukhishvili, TBA

R. Turner, discussion leader

W. Daly, "Adventures in molecular architecture with riddle rods."

J. M. J. Frechet, "Synthetic approaches to dendritic, hyperbranched, and globular-linear hydrid macromolecules."

K. Wynne, discussion leader

A. D. English, "Molecular dynamics of polyamides."

J. F. Rabolt, "Structure, orientation, and chemical architecture in crystalline and amorphous polymers by FT-IR and FT-Raman spectroscopy."

B. Anderson, discussion leader

S. Israel, "Surface characterization by laser contact angle goniometry."

J. J. O'Malley, discussion leader

S. El Shall, "Cationic polymerization initiated by laser vaporization of metals."

K. Matyjaszewski, "Facts and myths about living cationic polymerization of alkenes."

D. A. Tirrell, discussion leader

T. Smith, "Synthesis and morphological studies in systems of ionophoric block copolymers."

A. Eisenberg, "Recent advances in two- and three-dimensional aggregation of diblock ionomers and polyelectrolytes."

S. Huang, discussion leader

D. Y. Sogan, "Synthesis of polymers of controlled sequence and topology."

E. Chiellini, discussion leader

J. Sunamoto, "Hydrophobized polysaccharides—their self-aggregation in water and complexation with various guest molecules and molecular assemblies."

J. McGrath, discussion leader

M. Vert, "Hydrolytic degradation of LA/GA-based polyesters: Recent advances."

T. McCarthy, "Chemical control in polymer adsorption."

M. E. Galvin, discussion leader

W. J. Brittain, "Mechanistic studies of carbonate macrocyclization."

Predictive Theory in Biological Oceanography and Its Evaluation

Colby-Sawyer College, New London, NH

P. A. Jumars, chair; G. A. Jackson, vice chair

15–20 August

Incorporating diverse constraints: G. A. Jackson, discussion leader

D. Tilman, "Multiple constraints and trade-offs."

E. Hofmann, "Process modeling across disciplines."

M. Mangel, "State variable models and predictive oceanography."

Developments in foraging theory: P. A. Jumars, discussion leader

L. A. Real, "New developments in risk-sensitive foraging."

J. Gilliam, "Eat and be eaten."

Predictability of phytoplankton blooms: G. T. Evans, discussion leader

M. R. Lewis, "Prediction of phytoplankton blooms."

J. C. Patterson, "Prediction of phytoplankton blooms."

V. Smetacek, "Induction of blooms by melt water from receding ice edges: Predictions and observations."

Existence of planktonic microenvironements: J. Lehman, discussion leader

F. Azam, "Microbiology of phycospheres and micropatches."

K. Stolzenbach, "Small-scale diffusional environments."

Prediction and measurement of trophic transfer: R. N. Hughes, discussion leader

T. Fenchel, "Bioenergetic predictions of predator-prey relations."

M. J. Dagg, "Estimating feeding rates in the field."

D. L. Penry, "Predicting feeding rates."

Analog modeling of marine communities: Is it feasible?: M. A. R. Koehl, discussion leader

B. K. Sullivan, "Mesocosm successes in testing predictions and generating theory."

A. R. M. Nowell, "Dynamical scaling of coupled biological-physical processes."

Testing of recruitment models: C. A. Butman, discussion leader

J. Roughgarden, "Testing of recruitment models."

B. Sanderson, "Testing of recruitment models."

C. T. Taggart, "Testing of recruitment models."

P. A. Jumars, discussion leaders

P. Calow, "Closing the gap between functional and numerical responses."

Incorporating genetic constraints: S. R. Fain, discussion leader

S. Giovannoni, "Genetic analysis of marine bacterial communities."

J. E. Neigel, "Promise and power of DNA analyses."

P. Smouse, "Inference from genetic data: The mixed stock problem."

Proteins

Tilton School, Tilton, NH

Y. Paterson and K. A. Dill, co-chairs

13–18 June

Kinetics, folding intermediates, and pathways: P. S. Kim, discussion leader

C. M. Dobson, "Pathways of lysozyme folding."

A. M. Gronenborn, "Kinetics of folding of the all β-sheets protein, interleukin-1β."

J. Weissman, "Roles of the pro region and PDI in the folding of BPT1."

R. L. Baldwin, "Helix propensities and the molten globule intermediate of apomyoglobin."

Theory, prediction, and simulation: B. Honig, discussion leader

A-S. Yang, "Folding simulations using simplified free energy representations."

R. H. Swendsen, "Almost-Markovian Monte Carlo simulations of biological molecules."

S. Benner, "Protein structure: Sequence analysis, prediction, and de novo design."

P. G. Wolynes, "Protein folding: The spin-glass perspective."

Protein design: J. S. Richardson, discussion leader

M. Hecht, "A binary code for protein design."

M. Mutter, "Non-natural architecture in protein design."

H. Helinga, "Design of metalloproteins: Theory and experiment."

T. Handel, "Structure and dynamics of natural and designed 4-helix–bundle proteins."

Muscle proteins: Structure and force generation: R. Cooke, discussion leader

I. Rayment, "Structure of the myosin head by x-ray crystallography."

K. Holmes, "Structure of the actin monomer and the actin filament."

J. Spudich, "Functional mutants of the myosin head."

Crystallization and aggregation: G. B. Benedek, discussion leader

L. R. De Young, "Correlation of protein aggregation with protein stability."

G. Thurston, "Statistical thermodynamics of the liquid-liquid and liquid-solid phase boundaries of aqueous protein solutions."

S. Durbin, "Kinetics of protein crystallization and growth."

Immunoglobin-ligand interactions: E. D. Getzoff, discussion leader

B. Baird, "Cell-bound IgE as a model for ligand-receptor interactions."

M. Amzel, "Recognition of small molecules by antibodies: Structural and thermodynamic aspects."

A. McPherson, "Structures of an intact antibody and an idiotype/anti-idiotype complex."

In vivo folding: E. Craig, discussion leader

A. Horwich, "In vivo studies of chaperone function."

D. Agard, "Catalysis of protein folding: The role of protein pro-regions."

J. Hendrix, "Function of molecular chaperones during de novo protein folding."

L. Hendershot, "Role of BIP in protein folding and assembly in the ER."

D. E. Koshland, Jr., "Protein structure and transmembrane signaling mechanisms."

Packing and steric effects: F. M. Richards, discussion leader

E. E. Lattman, "Insertion mutants and internal packing in staph nuclease."

A. P. Minton, "Effects of molecular crowding and confinement on Tertiary, Quaternary, and higher order structure of proteins."

R. T. Sauer, "What mutants tell us about folding and packing."

M. Laskowski, Jr., "Binding of amino acid side chains to cavities in proteins."

Purines, Pyrimidines, and Related Substances

Salve Regina University, Newport, RI

W. Plunkett, chair; V. E. Marquez, vice chair

4–9 July

Enzyme mechanisms: S. Eriksson, discussion leader

D. S. Shewach, "Regulation of deoxycytidine kinase activity."

F. A. Quiocho, "Atomic structure of adenosine deaminase complexed with a transition-state analog: Understanding catalysis and immunodeficiency mutations."

F. Maley, "Comparison of primary structures of human and T4-phage deoxycytidylate deaminases and properties of the enzymes."

Modulation of 5-fluorouracil: R. B. Diasio, discussion leader

T. Spector, D. Porter, and D. Nelson, "5-ethynyluracil (776C85): An inactivator of uracil reductase that potentiates 5-fluorouracil."

Antisense oligonucleatides: J. Martin, discussion leader

C. Hélène, "Sequence-specific control of gene expression by triplex-forming oligonucleatides."

C. F. Bennett, "Oligonucleotides: A novel class of anti-inflammatory angents."

B. Froehler, "Antisense gene inhibition by novel oligonucleotide analogs."

Biochemical modulation: S. Grant, discussion leader

V. Gandhi, "Modulation of ara-C metabolism by fludarabine during therapy."

P. Sunkara, "Biological studies on (E)2′-fluoromethylene-2′-deoxycytidine, a novel inhibitor of ribonucleotide reductase."

Novel synthetic procedures: V. Marquez, discussion leader

J. McCloskey, "Discovery and characterization of new natural nucleosides."

N. Katagiri, "Synthesis and anti-HIV activity of 9-[c-4,t-5bis(hydroxymethyl)cyclopent-2-en-r-yl]-9H-adenine (BCA) and related carbocyclic nucleoside."

A. D. Borthwick, "Synthesis and antiviral activity of fluorocarbocyclic nucleosides."

Nucleoside transport: C. Cass, discussion leader

A. R. P. Paterson, "Nucleoside transport processes in leukemia cells from patients."

Antivirial compounds: R. F. Schinazi, discussion leader

Y-c. Cheng, "2′,3′-dideoxy-3′thiacytidine: Metabolism and action."

A. Fridland, "Metabolism and antiretroviral activity of nucleoside phosphonate prodrugs."

B. Larder, "Molecular studies of HIV drug resistance."

Anti-HIV nucleosides: J. Horwitz, discussion leader

S. Broder, "Future perspectives of anti-HIV nucleosides in the treatment of AIDS."

Nucleoside pharmacodynamics: J. A. Nelson, discussion leader

K. A. Jacobson, "Novel therapeutics acting via purine receptors."

D. Kufe, "Activation of signal transduction pathways by Ara-C."

T. S. Lawrence, "Radiosensitizing nucleosides."

Quantitative Structure-Activity Relationships

Tilton School, Tilton, NH

H. Kubinyi, chair; R. S. Pearlman, vice chair

8–13 August

"QSARs" for efficacy: Considerations beyond receptor affinity: J. Dearden, discussion leader

M. Johnson, "Modeling relative metabolic occurrence of alkyl/nitrogen bond cleavage using structure/reactivity maps."

F. Darvas, "Knowledge-based systems for drug disposition optimization."

A. Miklavc, "Rate of dissociation of drugs from receptor sites: Its relevance and the rate-determining mechanism."

Topological indices and related issues: L. Kier, discussion leader

L. Hall, "Design of molecules directly from QSAR equations."

J. Bradshaw, "Topological approaches to drug design."

Statistical methods applied to QSAR: S. Wold, discussion leader

J. Greene, "Statistical techniques for assessing structure-activity hypotheses."

I. Moriguchi, "Fuzzy adaptive least squares and its use in QSARs."

S. Clementi, "New chemometric tools for 3D-QSAR modeling."

QSAR-related applications of neural networks: T. Andrea, discussion leader

D. Livingstone, "Neural networks in QSAR: Uses and abuses."

J. Wikel, "Use of neural networks for variable selections in QSARs."

3D searching: R. Sheridan, discussion leader

B. Masek, "Conformational flexibility in 3D database searching."

J. Mason, "Conformationally flexible 3D databases: A valuable resource for drug design?"

J. Eyermann, "The role of 3D searching in the design of potent non-peptide HIV-1 protease inhibitors."

Molecular design through receptor structure elucidation: F. Cohen, discussion leader

M. Hibert, "Modeling of G protein–coupled receptors: Potentials and limitations."

S. Fesik, "NMR studies of biomacromolecules: Applications in drug design."

Pharmacophore identification and "de novo" design: S. Dixon, discussion leader

Y. Martin, "DISCO: A rapid strategy for pharmacophore identification."

H-J. Böhm, "De novo design of protein ligands."

D. Weininger, "de novo design of receptor ligands by molecular evolution."

Role of computational methods in *real world* molecular design: J. Snyder, discussion leader

Round-table discussion panelists: J. Bristol, G. Maggiora, G. Marshall, and H. Weintraub

3D QSAR and related issues: J. McFarland, discussion leader

C. W. Andrews, "Alignment of flexible molecules using 3D fields."

P. Floersheim, "New experiences with comparative molecular field analysis."

V. Golender, "APEX-3D: Expert system for predicting biological activity."

Reactive Polymers, Ion-Exchangers, and Adsorbents

Salve Regina University, Newport, RI

C. Horváth, chair; P. A. Yarnell, vice chair

22–27 August

Novel types of ion-exchangers and adsorbents: R. A. Albright, discussion leader

V. Davankov, "Macronetwork polymer structures and their applications in ion-exchange."

W. Fries, "Ion-exchangers with short diffusion path."

D. D. Frey, "Theory of adsorption presence in packed beds with intraparticulate convection."

Environmental applications: S. Alexandratos, discussion leader

A. K. Sengupta, "Heavy ion removal by a hydrid ion-rich material."

A. Clearfield, "New sorbents and ion-exchangers for nuclear waste solution remediation."

Ultrapure resins for ultrapurification of water: J. Stahlbush, discussion leader

M. J. McNulty, "Leaching from strong cation exchange resins."

W. Aqui, "Mixed bed performance in ultrapurification of water."

Molecular recognition at polymer surfaces: K. Caldwell, discussion leader

D. Armstrong, "Chiral separation by immobilized cyclodextrin systems."

I. Arnold, "Template polymerization based on metal ion binding for molecular recognition."

F. Regnier, "Recent progress in understanding of protein binding to chromatographic surfaces."

Polymers as catalysts: H. R. Allcock, discussion leader

W. T. Ford, "Polymer and micelle-bound catalysts for organic synthesis."

T. J. McCarthy, "Surface modification of polymers for use as catalysts."

Ion-exchange chromatography of biopolymers: A. Ramel, discussion leader

J. Stahlberg, "Electrostatic theory of protein adsorption in chromtography."

A. Lenhof, "Protein binding in ion-exchange chromatography."

W. Hancock, "Frontiers of protein analysis and characterization."

Red Cells

Plymouth State College, Plymouth, NH

D. Engel, chair; P. Agre, vice chair

8–13 August

Advances in membrane biology derived from red cell studies: V. Bennett, discussion leader

R. Dubreuil, TBA

W. J. Nelson, TBA

A. Bretscher, TBA

Globin gene regulation: F. Grosveld, discussion leader

G. Stamatoyannopoulos, TBA

M. Groudine, TBA

Erythroid transcription factors: S. Orkin, discussion leader

G. Felsenfeld, TBA

B. Emerson, TBA

S. Jane, TBA

P-H. Romeo, TBA

Molecular basis of membrane transport: J. Lingrel, discussion leader

R. Kopito, TBA

M. L. Jennings, TBA

M. Mueckler, TBA

Non-globin gene expression: B. Forget, discussion leader

J. Winkelmann, TBA

J. Conboy, TBA

E. Benz, TBA

Enbryogenesis: F. Costantini, discussion leader

D. Melton, TBA

A. Berns, TBA

L. Zon, TBA

Red cell structural proteins and membrane integrity: M. Narla, discussion leader

P. Low, TBA

A. H. Chishti, TBA

P. Agre, discussion leader

Erythropoiesis/hematopoiesis: K. Ksebo, discussion leader

A. Bernstein, TBA

M. Dexter, TBA

D. Williams, TBA

H. Beug, TBA

Second Messengers and Protein Phosphorylation

Kimball Union Academy, Meriden, NH

G. L. Johnson, chair; J. Avruch, vice chair

13–18 June

Cyclases and phaopholipases: Structure and regulation: R. Iyengar, discussion leader

R. Iyengar, "Diverse regulation of Gs-stimulated adenylyl cyclases."

B. Conklin, "Signal sorting by chimeric G proteins."

A. Smrcka, "Regulation of PLCβ isozymes by G protein α and βγ subunits."

T. K. Harden, "Receptor regulation of phospholipase Cβ."

Ligand-regulated ion channels: D. Clapham, discussion leader

D. Clapham, "Receptor-encoded calcium waves."

D. Cooper, "Physiological roles and regulation of Ca^{2+}-sensitive adenylyl cyclases."

C. Kleuss, "G protein βγ complexes selectivity regulate ion channel activity."

Heterotrimeric G proteins—structural domains, regulation, and function: H. Hamm, discussion leader

H. Hamm, "G protein interaction with receptors and effectors."

D. Manning, "Phosphorylation of G_z."

C. Malbon, "Pertubation of G protein expression and function using antisense oligonucleotides."

R. Fertel, "G proteins in dictylostelium."

Seven membrane spanning receptors—structure, coupling, and signaling: P. Casey, discussion leader

P. Casey, "Prenylation and G protein signaling."

D. Oprian, "Constitutive active mutants of rhodopsin."

G. L. Johnson, "Signal pathways regulated by G_i-coupled receptors."

Protein kinases—structure, regulation, and function: M. Cobb, discussion leader

M. Cobb, "ERKs: Expression and regulation."

A. Kazlauskas, "PDGF receptor mitogenic signaling."

M. White, "Role of IRS-1 in insulin signal transduction."

J. Avruch, "Hormone and growth factor–regulated cytoplasmic protein ser/thr kinases."

Signal transduction pathways controlling gene expression: R. Davis, discussion leader

R. Davis, "Signal transduction and control of gene expression by the EGF receptor."

J. Hoeffler, "Growth factor regulation of ATF-2 transcriptional activity."

J. Haebner, "Structural properties of CREB."

J. Arino, "Yeast protein phosphatases."

GTPases: M. Rasenick, discussion leader

M. Rasenick, "Activation of G proteins by cytoskeletal elements."

G. Bokoch, "Regulation of phagocyte NADPH oxidase by *rac* proteins."

M. Wessling-Resnick, "Posttranslational modification and *rab*-5 function in endocytosis."

P. Melancon, "ADP-ribosylation factors (ARFs) and intra-Golgi transport."

Plenary lecture

W. Catterall, "Modulation of voltage-gated sodium and calcium channels by protein phosphorylation."

Signal transduction, oncogenes, viral products, and the cell cycle: E. Moran, discussion leader

E. Moran, "E1a intervention in cell growth."

D. Pallas, "T antigen regulation of protein phosphatase 2A."

W. Heidemann, "Integration of the Ras and cyclin pathways."

M. Hoekstra, "Do workhorse protein kinases regulate DNA metabolism?"

Solar Plasma and MHD Processes

Plymouth State College, Plymouth, NH

E. Zweibel, J. M. Finn, co-chairs

8–13 August

The solar interior: Rotations, convection, and magnetic fields: A. Brandenburg, discussion leader

T. Tarbell, "High-resolution observations of the solar photosphere."

J. Toomre, "Helioseismic probes of large-scale flows in the solar interior."

K. Harvey, "Large-scale surface rotation and magnetic patterns."

B. Kleva, discussion leader

Dynamics of the solar convection zone: Theory and simulation: M. Proctor, discussion leader

F. Cattaneo, "Numerical simulations of convection."

N. Weiss, "Recent developments in dynamo theory."

B. Rosner, "Magnetoconvection and dynamo theory."

Magnetic reconnection in theory, simulation, and experiment: D. Barnes, discussion leader

J. Drake, "Quasi-Alfvenic magnetic reconnection in the solar atmosphere."

H. Strauss, "Three-dimensional reconnection in solar magnetic fields."

R. Perkins, "Laboratory studies of magnetic reconnection as a plasma physics phenomenon."

Boundary conditions and geometry: What do laboratory plasmas tell us about the sun?: A. Boozer, discussion leader

R. Kulsrud, "Reconnection in laboratory and astrophysical plasmas."

A. Hood, "MHD instabilities in coronal loops."

A. Reiman, "The behavior of open field lines in tokamaks with nonaxisymmetric magnetic perturbations."

Formation of tengential discontinuities, loss of equilibrium, and reconnection: R. Sudan, discussion leader

E. Parker, "Tangential discontinuities and coronal heating."

B. C. Low, "Evolution to nonequilibrium by footpoint motion."

J. Greene, "Three-dimensional reconnection."

Coronal structure and heating: T. Holzer, discussion leader

Z. Mikic, "Estimation of coronal magnetic fields from vector magnetograms."

F. Bagenal, "Inversion techniques for coronal structure."

H. Hudson, "The solar x-ray corona."

MHD activity in the laboratory: D. Schnack, discussion leader

S. Prager, "MHD processes in reversed field pinch experiments."

P. Guzdar, "Fluid convection and spontaneous vortex reversals."

E. Frederickson, "X-ray tomography measurements of sawtooth crashed and disruptions in tokamaks."

Solar flares: T. Bogdan, discussion leader

E. Lu, "Avalanche model for solar flares."

R. Ramaty, "Particle acceleration in solar flares."

J. Karpen, "Modeling of solar flares."

Staphylococcal Diseases

Proctor Academy, Andover, NH

G. Peters, chair; G. Archer, vice chair

8–13 August

Methicillin resistance: B. Berger-Baechi, discussion leader

H. Chambers, "Penicillin-binding proteins."

A. Tomasz, "Cell wall alterations in methicillin resistance."

R. Arbeit, "Epidemiology and clonality of methicillin resistance."

Lantibiotics and bacterial interference: S. Projan, discussion leader

H-G. Sahl, "Lantibiotics: Structure and mode of action."

F. Götz, "Biosynthesis and genetics of lantibiotics."

Staphylococcal toxins: S. Bhakdi, discussion leader

M. Betley, "Entertoxins."

Y. Piemont, "Leucocidin and gamma toxin."

W. Seeger, "Pathophysiological implication of staphylococcal exoproteins."

Cell surface structure: G. Pier, discussion leader

C. Lee, "Genetics of staphylococcal capsule."

V. Fischetti, "Protein A and wall proteins of Gram-positive bacteria."

Biologic basis of metastatic infection: R. Proctor, discussion leader

F. Lowy, "In vitro modeling of metastatic seeding."

A. Bayer, "Platelet microbicidal proteins and endocarditis."

M. Herrmann, "Host and staphylococcal cell surface components–macromolecular interactions."

Construction and biology of cellular constituents: H. Labischinski, discussion leader

W. Fischer, "Cell membrane and lipoteichoic acid."

J. Lutkenhaus, "Cytosceletton and cell division."

Gene regulation: G. Stewart, discussion leader

S. Arvidson, "Agr and regulation of toxin production."

S. Khan, "Agr-independent regulation of toxin production."

G. Archer, "Regulation of conjugative transfer."

Toxic shock syndrome: R. Novick, discussion leader

T. Chow, "Pathophysiology and animal models."

P. Schlievert, "Cytokine release in TSS."

Antimicrobial resistance: D. Schaberg, discussion leader

D. Hooper, "Quinolone resistance."

K. Dyke, "Mupirocin resistance."

N. el Sohl, "Resistance to the synergistic association of streptogramine A and B."

Please send abstracts to Dr. Gordon Archer, Medical College of Virginia, Division of Infectious Diseases, Box 49, MCV Station, Richmond, VA 23298. FAX: 804-371-0570.

Statistics in Chemistry and Chemical Engineering

New Hampton School, New Hampton, NH

R. W. Hoerl, chair; S. Wold, vice chair

25–30 July

L. Hare, moderator

D. DeVeaux, "MARS, nets, PLS, and all that jazz, a data analytic perspective."

D. Duffy, discussant

M. Carey, moderator

L. Currie, "Statistical and chemical issues in detection and environmental modeling."

L. Gleser, discussant

A. Kalantar, moderator

D. Cook, "Graphical regression"

B. Gunter, discussant

M. Nemeth, moderator

S. Brown, "Chemometric applications of neural nets for classification and calibration."

B. Ripley, discussant

S. Vardeman, moderator

D. Wardrop, C. Garcia, "Process monitoring and control system evaluation."

T. Harris, discussant

D. Steinberg, moderator

D. Hinkley, "Resampling in non-parametric modeling."

S. Leurgans, discussant

C. Morgan, moderator

J. Sacks, W. Welch, K. Bowman, "Computer experiments for sensitivity analysis and prediction applied to atmospheric models."

J. Flueck, discussant

S. Wold, moderator

D. Stevens, "Process optimization by combining RSM and PLS."

B. Wise, discussant

J. Voelkel, moderator

D. Marquardt, "Principles for managing statistical consulting in industry: The example of twin metric process control."

G. Hahn, discussant

Structural Macromolecules: Collagen

Colby-Sawyer College, New London, NH

S. L. Adams and M. van der Rest, co-chairs

18–23 July

Modulation of collagen biosynthesis: F. Ramirez, discussion leader

P. Bornstein, "Regulation of collagen expression."

M. Breindl, "Cis regulatory elements in type I collagen genes."

G. Karsenty, "Mechanism of co-regulation of type O collagen genes."

Tissue specificity of collagen gene expression: D. Rowe, discussion leader

B. de Crombrugghe, "Lineage-specific control of collagen gene expression."

G. Sonenshein, "TGF-beta effects on type V and XI collagens."

Protein folding and supramolecularassembly: J. Engel, discussion leader

K. Kivirkko, "Prolyl-4-hydroxylase and protein disulfide isomerase."

K. Nagata, "A collagen-specific molecular chaperone, HSP47."

K. Kadler, "Fibrillogenesis in health and disease."

Models of matrix proteins: K. Kuhn, discussion leader

M. Baron, "Structures of protein modules."

R. Timpl, "Recombinant lamin-nidogen interactions."

Cell-matrix interactions and development: H. Kleinman, discussion leader

M. Aumailley, "Intracellular responses to matrix signals."

R. Chiquet-Ehrismann, "The tenascin gene family."

J. Fessler, "Synthesis and remodeling of *Drosophila* ECM."

ECM of the dermal/epidermal junction: J. Uitto, discussion leader

B. Burgeson, "Proteins involved in dermal/epidermal adhesion."

L. Bruckner-Tuderman, "Regulation and abnormalities of collagen VII expression."

Cartilage development: K. von der Mark, discussion leader

B. Upholt, "Chondrogenesis and pattern formation."

M. Pacifici, "Effects of retinoids and growth factors."

R. Cancedda, "Cartilage and endochondral bone formation."

A. Bradley, "Gene targeting in the mouse."

Lessons from mutations in matrix genes: B. Cole, discussion leader

E. Vuorio, "Transgenes causing chondrodysplasias and osteoarthoses."

B. Olsen, "Knockouts and transgene: Models for human diseases."

H. Dietz, "Molecular pathology of Marfan syndrome."

Supramolecules and Assemblies

New England College, Henniker, NH

J. E. Trend, chair; D. A. Tirrell, vice chair

4–9 July

A. P. Gast, discussion leader

C. W. Frank, "Miscibility of classic amphiphiles in monolayer assemblies of hairy rod polymers."

J. Frommer, "Scanning force microscopy on organic thin films."

R. N. McElhaney, "Physical studies of lipid phase behavior."

D. G. Rhodes, discussion leader

G. Scoles, "New insights into self-assembled monolayer structures via combined helium and x-ray diffraction studies."

M. Bloom, "Characterization of the structural and dynamical properties of fluid membranes using NMR."

F. C. DeSchryver, discussion leader

B. H. Robinson, "Enzymology in microemulsions and microemulsion-based gels."

S. L. Regen, "Perforated monolayers."

S. Shinkai, "Molecular recognition and switch functions on calixarene-based platforms."

D. H. Thompson, discussion leader

J. T. Groves, "Multi-heme assemblies in phospholipid bilayers."

M. A. Fox, "Long-distance electron transfer in polymers."

S. H. Gellman, discussion leader

C-H. Tung, "Enhancement of crown ethers via lipophobic interactions and cation complexation."

T. E. Mallouk, "Assembly of thin-film and extended solids using ionic and coordinate covalent bonds."

G. Decher, "Layer by layer–deposited multilayer assemblies of polyelectrolytes and protein—from ultra-thin films to protein arrays."

D. A. Tirrell, discussion leader

L. Addadi, "Recognition at crystal interfaces in biological systems."

T. W. Bell, discussion leader

H. W. Whitlock, "Ramifications of cavity shape in nonaqueous supramolecular complexation."

G. W. Gokel, "Self-assembly in supramolecular systems."

A. D. Hamilton, "The design and synthesis of artificial receptors for complexation and catalysis."

P. L. Luisi, discussion leader

J. Rebek, Jr., "Replications and recognition."

P. M. McGuiggan, discussion leader

J. Warner, "Characterization and use of solid-state phenol-amide assemblies."

H. O. Ribi, "Commercialization of molecular membranes: Their development and use in rapid and simple medical diagnostic products."

D. D. Miller, "The interaction between photographic gelatin and anionic surfactants."

Abstracts of posters may be submitted to the vice chair, Professor David A. Tirrell, Department of Polymer Science and Engineering, University of Massachusetts at Amherst, Amherst, MA 01003.

Thermosetting High-Performance Materials

Plymouth State College, Plymouth, NH

C. Feger, chair; B. Schultz, vice chair

27 June–2 July

R. Lagasse, discussion leader

R. Mühlhaupt, "Silicone-modified thermosets and hybride composites."

J. Gillham, discussion leader

R. Farris, "Shrinkage stress as a function of geometric constraint in epoxies and tough reactive thermoplastic–epoxy resin systems."

TBA, discussion leader

J. L. Halary, "Molecular evidence for structure-property relationships in model epoxy networks."

B. Prime, discussion leader

S-S. Chang, "Dependence of ultimate glass transition temperature on curing history."

M. Vallance, discussion leader

W. Bradley, "Structural applications of polymer composites for ocean environments."

W. Zukas, discussion leader

A. Letton, "The effect of moisture on the mechanical and physical chemical properties of thermosets and composite interfaces."

R. Leibfried, discussion leader

R. Rothchilds, "Polymeric composites for high-speed civil transport."

H. Bair, discussion leader

S. Eguchi, "Design of epoxy encapsulating compounds for high semiconductor packages."

S. A. Bidstrup, discussion leader

J. Coburn, "Structure and property development in high-temperature polyimide coatings and films."

C. May, discussion leader

D. Lewis, "Microwave curing of polyimides."

M. Rakas, discussion leader

G. Levita, "Microwave monitoring of thermoset cure."

I. Goldfarb, discussion leader

R. Young, "Cross-polymerized diacetylene-containing copolymers and blends."

F. Kelley, discussion leader

R. Parnas, "Resin transfer modeling optimization using 3-D permeability vectors."

TBA, discussion leader

J. Riffle, "High-performance polymeric powders."

J. Gotro, discussion leader

D. Prevorsek, "Dynamics of cyanate ester networks."

N. Johnston, discussion leader

K. Zwilsky, "A material view from Washington."

TBA, discussion leader

G. Martin, "The characterization of curing behavior and the physical properties of cyanate ester resin systems."

B. Schultz, discussion leader

J. Hedrick, "Thermoplastic toughening of high Tg, fluorine-containing polycyanurate thermosets."

Three-Dimensional Electron Microscopy of Macromolecules

New Hampton School, New Hampton, NH

T. S. Baker, chair; A. C. Steven, vice chair

27 June–2 July

Hybrid technology: Electrons and x-rays working together: E. F. J. van Bruggen, discussion leader

T. Smith, "Rhinovirus-antibody interactions."

A. Brisson, "Complementary EM/x-ray studies of cholera toxin."

Late breaking results: Advances in crystallization, computation, and instrumentation: J. Lepault, discussion leader

Viruses and other macromolecular assemblies: P. Stewart, discussion leader

E. M. Mandelkow, "Dynamics of microtubule assembly/disassembly."

M. Yeager, "Conformational changes in reoviruses."

S. Fuller, "Centriole structure."

After the ice age: Non-cryogenic preparation techniques revisited: U. Aebi, discussion leader

J. Stoops, "Negative stain revisited."

T. Allen, "HRSEM of metal-shadowed nuclear pore complexes."

S. Weinkauf, "Decoration contrast on protein molecules."

Site-specific labeling: Cluster compounds and other fiducial markers: E. Gogol, discussion leader

J. Hainfeld, "Nonogold labels."

N. Boisset, "Immuno- and nanogold labeling of macromolecules."

B. Trus, "Identification of epitopes on herpes simplex virus."

Late breaking applications in structural biology: C. Mannella, discussion leader

Three-dimensional reconstructure: New strategies and algorithm: M. van Heel, discussion leader

D. DeRosier, "Automated processing of helical structure."

M. Radermacher, "SECReT(s) in vitreous water and negative stain."

W. Baumeister, "Automated tomography of macromolecules."

Progress in image formation, acquisition, and display: J. Langmore, discussion leader

Panelists: J. Langmore, R. Henderson, and J. Brink

Membranes and their cytoskeleton: G. Soskinsky, discussion leader

R. Josephs, "Macromolecules of the erythrocyte."

N. Unwin, "Functional states of the acetylcholine receptor."

The Impact of Volcanism on Climate

New England College, Henniker, NH

L. S. Walter, chair; O. B. Toon, vice chair

25–30 July

Overview: L. Walter, discussion leader

S. Self, "Volcanism and climate: An overview from a volcanological perspective."

P. Crutzen, "Overview on atmospheric chemical effects."

G. Brasseur, "Overview on climate effects."

Radiative transfer: O. B. Toon, discussion leader

P. Russell, "Size distributions and optical properties of post-Pinatubo aerosols."

V. Ramaswamy, "Radiative and climate impact of volcanic aerosols."

Magmatic sources and plume dynamics: H. Sigurdsson, discussion leader

M. Rutherford, "Volcanic additions of C-O-H-S-Cl gases to the atmosphere: Experimental studies."

T. Gerlach, "The excess sulfur problem—a review and critique emphasizing Pinatubo and El Chichon SO_2 emissions."

L. Wilson, "Factors controlling the rise heights of eruption plumes and their dispersion."

Climate modeling and effects: A. Robock, discussion leader

J. Hansen, "Comparison of observations and climate models."

C. Mass, "Extreme weather events."

Effects on ozone chemistry: E. Browell, discussion leader

S. Solomon, "Connections between ozone and volcanic effects."

M. Schoeberl, "Satellite observations of possible effects of El Chichon and Pinatubo on stratospheric ozone."

D. Hoffman, "Balloon observation of effects of volcanism on stratospheric ozone."

Cloud distribution and dissipation: L. Stowe, discussion leader

A. Krueger, "TOMS observations of SO_2 clouds."

M. P. McCormick, "Satellite and lidar observations of volcanic aerosols."

Chemical reactions in the cloud: P. Crutzen, discussion leader

R. Turco, "Atmospheric chemical conversions involving volcanic gases."

J. Waters, "UARS observation of the Pinatubo cloud."

M. Tolbert, "Heterogeneous chemistry on volcanic debris."

Geologic/tectonic settings: W. Rose, discussion leader

T. Casadavall, "Contemporary volcanism and climate."

J. Luhr, "Holocene volcanism and climate perturbations."

Records of volcanic effects on climate: M. Rampino, discussion leader

K. Hirshboek, "Climatic response to major eruptions: Tree ring evidence and implications."

J. Palais, "The record of volcano-climate interactions in ice cores."

K. Pang, "The historical record of volcano-climate interactions."

Water and Solute Exchange in the Microvasculature

Plymouth State College, Plymouth, NH

F. E. Curry, chair; R. K. Jain, vice chair

13–18 June

Endothelial barrier properties and their formation: F. E. Curry, discussion leader

C. C. Michel, "Intact microvessels."

TBA, "Cultured endothelial cells."

J. Bischoff, "Capillary tube formation."

Transcapillary exchange of macromolecules: E. M. Renkin, discussion leader

J. E. Schnitzer, "Macromolecule binding proteins of endothelium."

V. Bickel, "Chimeric peptide transport."

Calcium and microvessel permeability: J. Diana, discussion leader

A. Luckhoff, "Endothelial cell calcium channels."

T. A. Brock, "Growth factor signaling in vascular endothelium."

F. Vargas, "Albumin modulation of calcium influx."

Endothelial cell shape and volume in barrier regulation: M. E. O'Donnell, discussion leader

R. Wysolmersky, "Force development in endothelial cells."

G. W. Schmid-Schoenbein, "Cell micromechanics."

Metastasis and cell-cell interactions: T. Tedder and R. Jain, discussion leaders

B. Zetter, "Organ-specific metastasis."

K. W. Anderson, "Deformability and adhesion in metastasis."

T. Mayadas-Norton, "Targeted disruption of P-selection gene in mice: Implication for leukocyte adhesion."

Permeability regulation by bradykinin and PAF (cellular, single vessel, whole organ approaches): V. H. Huxley and W. Duran, discussion leaders

D. Williams, "Modulation of single vessel permeability."

D. Bell, "Modulation of whole organ permeability."

New aspects of interstitial transport: A. E. Taylor, discussion leader

R. K. Reed, "Beta 1–integrins and interstitial pressure."

R. Jain, "Convection, diffusion, and binding in the interstitium of tumors."

W. Comper, "Charge: Cell and matrix interactions."

Non-inflammatory modulations of capillary permeability: U. S. Ryan, discussion leader

V. Tucker, "Regulation of permeability by ANF."

Y. Yuan, "Role of nitric oxide in permeability regulation."

Oxidative states: M. E. Gerritsen, discussion leader

A. Malik, "Oxidant-dependent mechanisms of increased permeability."

N. Granger, "Permeability changes associated with leukocyte migration."

S. Elliott, "Oxidant stress and ion transport in endothelial cells."

Wound Repair

Colby-Sawyer College, New London, NH

J. M. Davidson, chair; T. A. Mustoe and G. Grotendorst, co-vice chairs

13–18 June

Cell differentiation during tissue repair: L. B. Nanney, discussion leader

C. Compton, "Epidermal differentiation."

G. Gabbiani, "Fibroblast differentiation."

S. Liebovitch, "Monocyte differentiation."

Defective tissue repair: T. Mustoe, discussion leader

D. Knighton, "The diversity of non-healing wounds."

F. Grinnell, "Biochemical defects in the chronic wound."

Insoluble mediators of repair—the matrix: C. M. LaPiere, discussion leader

R. A. F. Clark, "Integrin signaling."

H. P. Ehrlich, "Regulation of collagen form and function."

D. Woodley, "Repair of the basement membrane zone."

Termination signals: J. M. Davidson, discussion leader

E. Amento, "Control of inflammation."

A. Roberts, "TGFB signals in wound repair."

Activation signals: G. Grotendorst, discussion leader

S. Wahl, "Lymphokines."

D. B. Rifkin, "Fibroblast growth factor."

S. Aaronson, "Keratinocyte growth factor."

Tissue biomaterial interactions: G. Abatangelo, discussion leader

G. Ksander, "Reactions to topical (bio)-materials."

K. N. Broadley, "Tissue implants."

Bone and soft tissue repair: G. R. Martin, discussion leader

M. Bolander, "Bone healing."

A. Banes, "Mechanical stress."

A. R. Poole, "Cartilage repair."

Regeneration versus repair: M. A. Ferguson, discussion leader

R. Goss, "The biology of regeneration."

N. S. Adzick, "Fetal wound healing."

Fibroplasia: G. Pierce, discussion leader

M. Banda, "Regulation of proteolysis."

T. Krieg, "Regulation of collagen accumulation."

S. Russell, "The keloid as a fibrotic model."

X-ray Physics

Colby-Sawyer College, New London, NH

J. B. Hastings, chair; I. Robinson, vice chair

8–13 August

M. Blume, TBA

H. Kawata, TBA

N. Sakai, TBA

R. A. Cowley, TBA

T. Thurston, TBA

P. Coppens, TBA

L. Sorenson, TBA

M. Lehmann, TBA

D. Caspar, TBA

B. Stephenson, TBA

S. Dierker, TBA

Y-P. Feng, TBA

M. Hart, TBA

H. Ade, TBA

C. Jacobson, TBA

Zeolitic and Layered Structures

Plymouth State College, Plymouth, NH

J. M. Newsam, chair; M. E. Davis, vice chair

20–25 June

Synthesis fundamentals and products

S. I. Zones, "Aspects of the effectiveness of organo-cations as determinants of phase selectivity in zeolite synthesis."

F. Fajula, "Solutions and solid precursors in initial stages of zeolite crystallization."

H. Kessler, "Recent results in the synthesis of microporous materials in the presence of unusual templates and mineralizer."

Clathrate chemistry and structure

J. L. Atwood, TBA

M. Wiebcke, TBA

Zeolite catalysis—new processes and novel insights

A. Corma, TBA

P. Ratnasamy, TBA

F. Gortsema, TBA

Zeolite catalysis—new processes and novel insights

J. Lercher, TBA

L. E. Iton, TBA

Structure and bonding

G. V. Gibbs, TBA

I. G. Wood, TBA

O. Terasaki, TBA

Guest-host chemistry and physics in zeolites and layered solids

K. Balkus, TBA

L. F. Nazar, TBA

Progress in characterization

S. W. Carr, TBA

J. Haw, TBA

M. T. Melchior, TBA

Materials insights from the natural world

P. B. Moore, "Unconventional giant pore oxysalt structures."

Exciting new materials

A. Monnier, TBA

C. Y. Chen, TBA

S. L. Suib, TBA

Chemotherapy of Experimental and Clinical Cancer

Schwaebisches Bildungszentrum, Irsee, Germany

P. J. Houghton, chair; J. A. Hickman and L. Erickson, co-vice chairs

3–8 October

Cell cycle control in the response to chemotherapy: J. Hickman, discussion leader

D. Lane, "Functions and partners for p53P."

M. Kastan, "Molecular control of a G_1 cell cycle checkpoint following DNA damage."

M. Smulson, "Elucidation of function(s) of poly(ADP-ribose) polymerase around DNA strand breaks by expression of antisense RNA."

P. O'Connor, discussion leader

M. Roussel, "Regulation of G_1 cyclins and their cyclin-dependent kinase partners by the colony-stimulating factor 1."

L. Meijer, "Cell cycle control proteins, the protein kinase cdc2/cyclin B, and the phosphatase cdc25 as targets for identifying anti-mitotic compounds."

Novel approaches to drug design and discovery: M. Colvin, discussion leader

D. Matthews, "Design of novel thymidylate synthase inhibitors using iterative crystallographic analysis."

H. Bohm, "Computer-aided design of enzyme inhibitors."

F. Hauscheer, "High-performance parallel numerical simulation and DNA-targeted anticancer drugs."

J. Whiteley, discussion leader

M. Watterson, "An interdisciplinary approach to the development of new classes of protein kinase inhibitors."

R. Houghton, "Advances in basic research and drug discovery involving peptides."

Biochemical modulation of antimetabolites: G. Peters, discussion leader

D. Martin, "Enhanced activity of 5-fluorouracil by biochemical modulation of pyrimidines (PALA) and tumor cell energy."

R. Delap, "Thymidine nucleotide metabolism as a target for antimetabolite chemotherapy-clinical studies."

J. Houghton, "Molecular mechanisms of interferon modulation of 5-fluorouracil."

New approaches to the study of antineoplastic drugs: J. Lazo, discussion leader

M. Dietel, "Pathway and sorting of cytostatic drugs in malignant tumor cells."

Mechanisms and development of new antineoplastic agents: T. Connors, discussion leader

D. Fabbro, "Inhibitors of protein kinase C (PKC)—their potential and limitation."

D. Crowther, "Clinical development of bryostatins."

A. Jackman, "The development of folate-based thymidylate synthase inhibitors for clinical study."

A. Larsen, discussion leader

L. Wilson, "Kinetic stabilization of microtubule polymerization dynamics and inhibitors of mitotic spindle function by antimitotic."

F. Lavelle, "Taxotere: Biological properties and structure activity relationships."

Problems and potentials in therapy of brain tumors: L. Erickson, discussion leader

W. Pardridge, "Drug delivery to brain tumors."

G. Margison, "O^6-alkylguanine–DNA alkyltransferase and antitumor agent sensitivity."

H. Friedman, "O^6-alkyguanine–DNA alkyltransferase mediated drug resistance in CNS tumors."

Complex Fluids

Schwaebiches Bildungszentrum, Irsee, Germany

S. K. Sinha and D. Andelman, co-chairs

26 September–1 October

P. A. Pincus, discussion leader

S. Milner, "Theory of polymer brushes."

T. P. Russell, "X-ray and neutron reflectivity studies of polymer interfaces."

L. Auvray, "Polymers at interfaces—x-ray and neutron scattering studies."

J. F. Joanny, discussion leader

T. Hashimoto, "Phase transitions and self-assembly of polymers under shear flow."

K. Kremer, "Structure and dynamics of polyelectrolyte solutions."

M. Daoud, "Branched polymers and gels."

S. Marcelja, discussion leader

E. Sackman, "Structure and dynamics of membranes, coupled synthetic biological macromolecular networks."

A. Parsegian, "Action of neutral polymers on interacting surfaces."

C. R. Safinya, "Structure of membrane-associated proteins from synchrotron scattering."

G. Grest, discussion leader

M. Seul, "Modulated phases in low-dimensional systems."

M. W. Kim, "Applications of optical second harmonic generation to interfacial studies of complex fluids."

D. A. Weitz, discussion leader

J. Bibette, "Monodisperse emulsion droplets: Physics of squishy spheres."

P. Fabre, "Ferrosmectics and other amphicolloids."

A. Mehta, "The physics of real sandpiles."

S. Alexander, discussion leader

Y. Talmon, "Cryo-TEM and SAXS studies of surfactants, polymers, and surfactant/polymer systems."

K. Chari, "Rheology and SANS studies of polymer/surfactant interactions."

D. Roux, discussion leader

R. Lipowsky, "Adhesion of membranes."

R. B. Meyer, "X-ray and light scattering of polymer liquid crystals."

S. Ramaswamy, "Dynamics of lamellar phases."

Photosynthetic CO_2 Fixation and Metabolism in Plants

Schwaebisches Bildungszentrum, Irsee, Germany

B. Osmond, chair; S. Huber, vice chair

10–15 October

Rubisco and photosynthetic regulation: R. Jensen, discussion leader

A. Portis, "Rubisco activase—recent developments."

K. Mott, "Regulation of rubisco in vivo."

S. Von Caemmerer, "Evidence from transgenic plants."

PEPC-ASE regulation: H. Nimmo, discussion leader

R. Chollet, "Role of reversibly light-activated protein-serine kinase in C-4 PEPC-ASE."

M-L. Champigny, "Regulation of C-3 and anapleurotic PEPC-ASES."

Molecular and environmental control of PEPC-ASE: H. Bohnert, discussion leader

M. Matsouka, "Transcriptional regulation of C-4 enzymes."

K. Izui, "Kinetic and molecular aspects of PEPC-ASE."

K. Winter, "New ecophysiological aspects of CAM."

CO_2 fixation in leaves: I. Terashima, discussion leader

K. Raschke, "Biophysics and biochemistry of guard cell function."

J. Nishio, "Gradients of photosynthesis in sun and shade leaves."

Metabolic control of photosynthesis: M. Stitt, discussion leader

R. Scheibe, "Light modulation of stromal enzymes—kinetic aspects."

U. Sonnewald, "Photo assimilate partitioning in transgenic plants."

C. Foyer, "Modulation of end-product biosynthesis and its effects on CO_2 fixation."

Down regulation of PSII efficiency and CO_2 fixation: P. Horton, discussion leader

B. Genty, "Chlorophyll fluorescence and CO_2 fixation."

W. Adams, "Ecophysiological aspects."

Compartmentation, transport and translocators: H. Heldt, discussion leader

U-I. Flugge, "Structure/function of chloroplast TP/PI."

W. Frommer, "Sugar and amino acid transporters."

B. Lucas, "Plasmodesmatal function."

Tote bienen uter den linden: D. Walker, discussion leader

U. Heber, "Consequences of chloroplast function for leaf cell physiology."

Respiration of photoassimilates: L. Lambers, discussion leader

J. Siedow, "Alternative oxidase(s) in leaves."

R. Douce, "The glycine decarboxylase complex."

D. Randall, "Light regulation of leaf mitochondrial decarboxylase complex."

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