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Gordon Research Conferences



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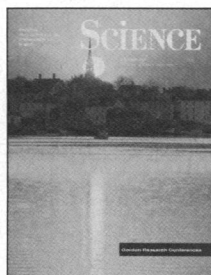
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COVER Sunset in Portsmouth, New Hampshire. See page 1100 for details of the 1990 Gordon Research Conferences. [Photograph by Craig Blouin/New England Photography]

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This Week in SCIENCE

Global desertification

DESERTIFICATION is on the rise. Semiarid regions are turning into deserts as human expansion and exploitation change runoff patterns, enhance erosion, and alter soil properties (page 1043). At the Jornada Experimental Range in southern New Mexico, for example, Schlesinger *et al.* are following how the overgrazing of large stretches of black grama grassland is causing redistribution of soil resources (water, nitrogen, and others) and how shrubs (creosote bush and mesquite) from neighboring deserts are invading the area. A self-perpetuating cycle of change toward aridity is being set in motion, with shrub canopies creating local "islands of fertility" separated by growing stretches of infertility. The new land conditions in turn can lead to changes in local atmospheric conditions. The contribution of desertification to global change is likely to be significant, because currently some one third of the earth's landmasses are semiarid or arid. The processes that are occurring at Jornada are being replayed throughout the world in regions such as West Africa's Sahel.

Saturn's hexagon

IMAGES of an unusual hexagonal cloud feature that is centered at Saturn's north pole were obtained some 10 years ago by the two Voyager spacecraft during their close encounters with the planet. The gigantic "stationary" hexagon is embedded in a fast-moving (100 meters per second) jet stream; it is apparently shaped and constrained by the jet stream and by nearby anticyclonic ovals. Allison *et al.* propose that the hexagon is a vertically trapped atmospheric Rossby wave, one of the large-scale, low-frequency oscillations that also characterizes circulation patterns in the earth's atmosphere and oceans (page 1061). Hubble telescope observations during the 1990s should provide some additional information about Saturn's atmosphere, but thereafter the next planned observations of

Saturn will be made in the 21st century by the Cassini orbiter. In the meantime, therefore, understanding of the structure and dynamic properties of the planet's deep atmosphere must come from model building and from inferences based on the previously recorded large-scale features such as this.

Comet coming

COMET Machholz will be visible to viewers in the Southern Hemisphere in June 1991 and to those in the Northern Hemisphere that August (page 1063). This unusual comet, which has a 5.3-year period and a high inclination, was first observed in 1986 by an amateur astronomer. Its short period is affording astrophysicists a fine opportunity for studying physical and behavioral changes that take place during a complete cometary orbit. The comet came within 0.127 astronomical units (AU) (the mean distance between the earth and sun) of the sun in 1986. According to forward and backward projections by Green *et al.*, it has been spiraling increasingly closer to the sun for centuries and will reach its minimum perihelion distance (0.03 AU) in the 25th century if it is still orbiting; after that, the perihelion distance should begin to increase. During the 1986 detection period, which lasted from May to September, the nucleus shrank, the coma and tails were lost, and the comet assumed a stellar appearance. It is still stellar, with its nucleus in a "low activity" state and outgassing occurring over only a fraction of the surface. The future for Comet Machholz could hold any of the following—continuation of the current orbital pattern, destruction by the sun, or evolution into an inactive asteroid-like object as surface ices vaporize.

Felicitous coupling

SPRING spawning of green sea urchins and blue mussels from the St. Lawrence estuary can be triggered by heat-stable substances released

by blooming phytoplankton (page 1071). Starr *et al.* found that filtrates from different types of phytoplankton stimulate spawning and that the extent of the spawning response is dependent on the amount of phytoplankton (and presumably the concentration of inducer) available. Male sea urchins and mussels responded somewhat faster than did females, and the sperm they produced also induced spawning in other individuals. In nature a phytoplankton bloom may induce the fastest male responders to release sperm; these sperm, in conjunction with additional phytoplankton inducers, may then trigger widespread synchronous "epidemic" spawning throughout the population. The direct coupling of blooming and spawning ensures that an ample food supply will be available for the larvae and that other environmental conditions—water temperature, absence of predatory zooplankton whose density is at an annual minimum during the spring bloom—will be conducive to larval survival.

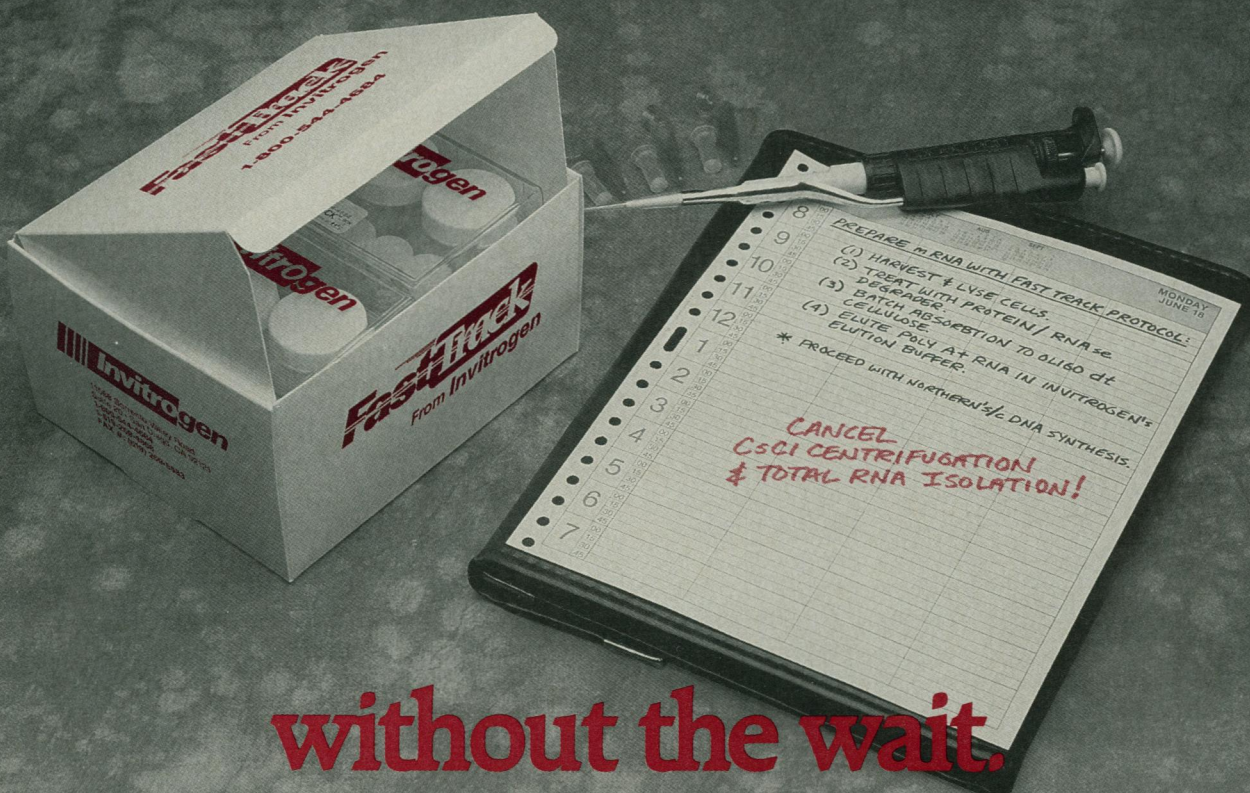
Carbon crunch

ANIMALS at deep-sea hydrothermal vents (HTV) have limited internal supplies of carbon; therefore, chemosynthetic bacteria living symbiotically inside giant tube worms and other invertebrates must make organic compounds from whatever carbon has come up through the host's plume (the gas exchange organ) and circulatory system (page 1094). Tissues of these animals have high $^{13}\text{C}/^{12}\text{C}$ values. In contrast, chemosynthetic bacteria in similar invertebrates living in other marine settings selectively incorporate ^{12}C rather than ^{13}C into organic compounds, and their $^{13}\text{C}/^{12}\text{C}$ values are low. Among HTV organisms, the $^{13}\text{C}/^{12}\text{C}$ values increased with increasing size, providing support for the contention of Fisher *et al.* that carbon limitation may be a problem for adult HTV animals but not for juveniles: juveniles need less carbon and their symbionts have the luxury of selectively using ^{12}C .

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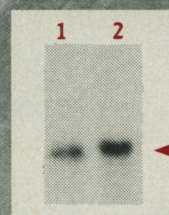


Figure 1.

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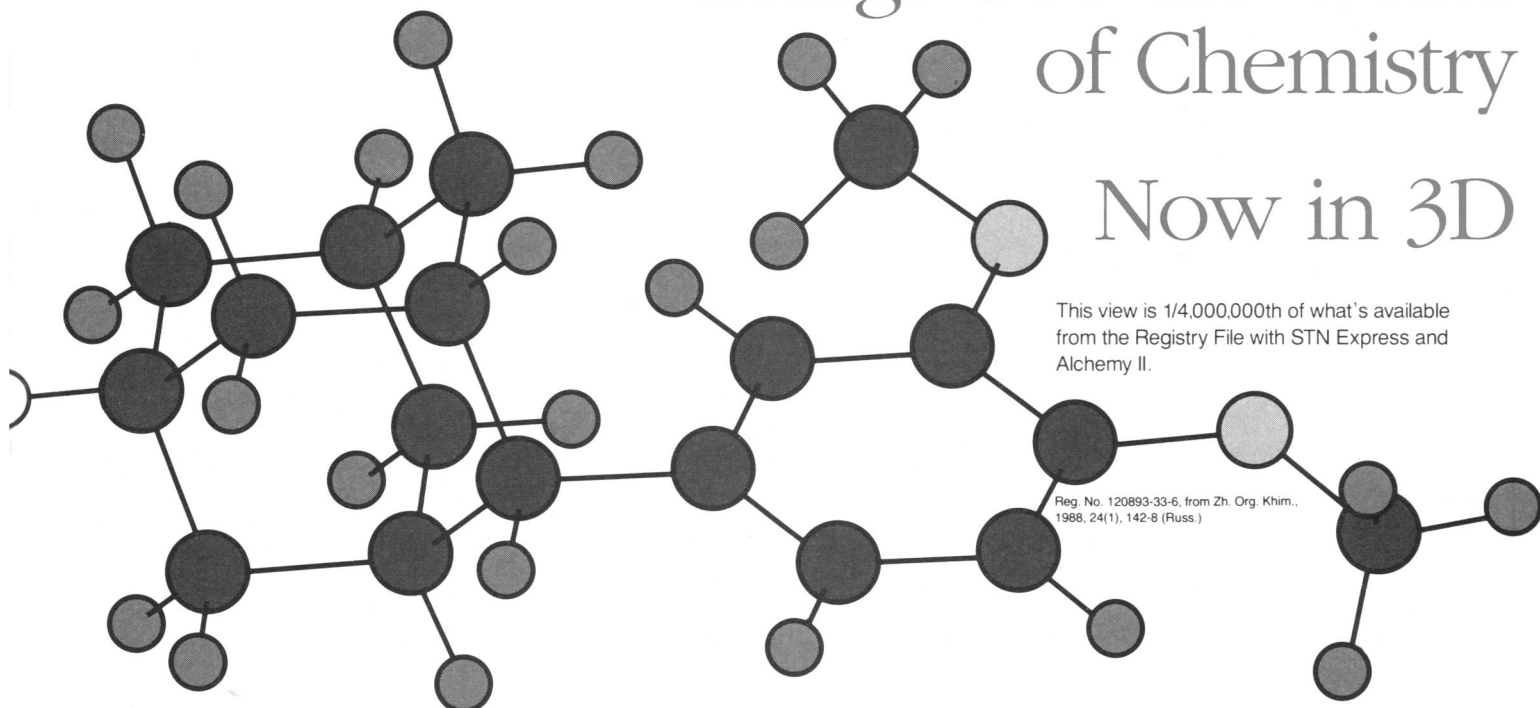
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 **NEURAL MECHANISMS IN CARDIOVASCULAR REGULATION** June 10-15 Chairs: Vernon Bishop, University of Texas HSC/San Antonio; Donald Reis, Cornell University Medical College. **Neuroanatomical Methodology for Deciphering CNS Autonomic Pathways.** A. Loewy, J. Cabot, A. Strack, R. Hume, P. Sawchenko, T. Milner; **Electrophysiologic Techniques.** R. Felder, S. Mifflin, G. Gebber, J. Champagnat, D. Kunze, G. Gerstein; **Cardiorespiratory Integration.** S. Morrison, M. Myers, D. Millhorn, S. Barman, R. Frysinger; **Spinal/Supraspinal Regulation of Sympathetic Activity.** L. Schramm, M. Gilbey, J. Osborn; **Regulation of the Exercise Response.** L. Rowell, T. Waldrop, D. Sheriff, M. Kaufman, R. Victor; **Translation of Environmental Stressors into Cardiovascular Disease.** A. Johnson, J. LeDoux, R. Kirby, R. Verrier, J. Koepke; **Interactions Between Neural and Local Vascular Mechanisms.** J. Faber, J. Lombard, C. Aalkjaer, N. Flavahan, B. Fleming; **Discussion of Selected Posters.** F. Gordon; **CNS and Cardiovascular Diseases.** J. Haywood, T. Westfall, R. McCall, J. DiMicco.

 **RETINOIDS** June 17-22 Chairs: Luigi De Luca, NIH/NCI; Peter Davies, University of Texas Medical School. **International Aspects of Vitamin A Nutrition.** J. Olson, B. Underwood, S. Hardjo, A. Sommer; **Plasma and Cellular Binding Proteins.** D. Goodman, W. Blaner, J. Darnell, J. Gordon, F. Chytil, D. Ong, R. Blomhoff, V. Colantuoni; **The Eye.** J. Saari, R. Rando, D. Bok, G. Chader; **Receptors and Gene Activation.** L. Gudas, V. Giguere, P. Chambon, P. Davies, T. Breitman; **Cell Interactions, Differentiation and Development.** L. De Luca, R. Lotan, M. Webber, G. Eichele, A. Jetten, J. Bertram; **Recent Developments.** P. Davies, J. Napoli; **Growth and Tumorigenesis.** M. Sporn, Major lecture; **Disease States.** K. Norum, S. Shapiro, R. Moon, D. Kochhar.

 **RECEPTORS** June 24-29 Chairs: Marc Caron, Duke University Medical Center; C. Ronald Kahn, Harvard University. **Synthesis and Assembly.** R. Klausner, J. Merlie, A. Helenius; **Structure.** M. Caron, D. Segaloff, P. Kelly, K. Mikoshiba; **Structure/Heterogeneity.** P. Seeburg, E. Peralta, T. Tanaguchi; **Effector Systems.** L. Birnbaumer, W.J. Tang, S.G. Rhee, D. Garbers; **Growth Factor/Tyrosine Kinase Superfamily.** C. Kahn, D. Morrison, S. Aaronson; **DNA Binding Protein/Steroid-Thyroid Hormone.** M. Rosenfeld, K. Damm, W. Schrader; **Regulation of Function.** R. Lefkowitz, P. Devreotes, R. Haganir; **Keynote Address: Molecular Characteristics of the Photoreaction Center.** H. Michel; **Pathophysiology.** S. Taylor, M. Hughes, W.W. Chin.

 **MOLECULAR ASPECTS OF METASTASIS** July 1-6 Chairs: George R. Martin, NIA/NIH; Leo Furcht, University of Minnesota. **Natural History of Human Cancers.** M. Lippman, J. Mulshine, E. Fearon, D. Coffey; **Tumor Cell Progression.** B. Vogelstein, G. Heppner, D. Lowy, M. Durst, N. Bourke; **Suppressor Genes.** H. Westphal, S. Baker, W.L. Wu, E. Harlow, C. Barrett, P. Steeg; **Genetic Events in Metastasis.** R. Kerbel, L. Liotta, D. Denhardt, I. Hart, A. Raz; **Malignant Cell Behavior - Migration.** K. Yamada, L. Furcht, E. Gherardi, E. Schiffmann; **- Attachment and Homing.** H. Kleinman, C. Damsky, J. Johnson, W. Ershler; **Pharmacological Modulation.** K. Olden, M. Gottesman, E. Reed, J. Rine, G. Martin, I. Hart, J. Folkman; **Angiogenesis.** J. Folkman, B. Zetter, M. Klagsbrun, D. Rifkin, S. Salahuddin, J. Vogel.

 **AUTOIMMUNITY** July 8-13 Chairs: Lawrence Steinman, Stanford University Medical Center; Malcolm Geffer, MIT. **T Cell Activation.** C. Fathman, M. Geffer, N. Sarvetnick; **Pathogenicity of T Cells.** D. McFarlin, W. Hickey, H. Wekerle, E. Alexander; **Immunogenetics.** J. Bell, H. Erlich, J. Nepom, J. Oksenberg; **T Cell Receptor Repertoire.** L. Steinman, H. Acha-Orbea; **Pathogenicity of B Cells.** F. Steinberg, B. Kotzin, S. Datta, R. Eisenberg, D. Klinman; **T Epitopes.** J. Rothbard, S. Zamvil; **Immune Therapy.** H. Weiner, I. Cohen, A. Vandenbark; **Keynote Address: Future of Immunogenetics.** H. McDevitt; **Immunotherapy.** C. Jacob, D. Wraith, D. Hafler.

 **VIRAL ASSEMBLY** July 15-20 Chairs: Jonathan King, MIT; Roger Burnett, WISTAR International. **3-D Structures of Virions.** R. Burnett, J. Hogle, W. Chiu, B. Prasad, S. Harrison; **Penetration and Uncoating.** A. Helenius, R. Webster, P. Spear, J. White; **Protein Folding, Processing and Maturation.** M. Gething, J. King, E. Wimmer, S. Crosslan; **Capsid Assembly in RNA Viruses.** R. Rueckert, T. Schuster, J. Jentoft, E. Hunter; **RNA Packaging.** R. Compans, L. Mindich, J. Johnson, P. Palese; **Capsid Assembly in DNA Viruses.** R. Garcea, P. Prevelige, W. Gibson, M. Bina, D. Caspar; **DNA Encapsulation.** S. Casjens, M. Feiss, D. Anderson; **Envelope Assembly and Budding.** L. Mindich, B. Moss, J. Rose, J. Strauss, R. Compans; **Therapeutic Strategies.** P. Fitzgerald, G. Air, G. Diana.

 **SYNTHESIS AND FUNCTION OF VITAMIN K-DEPENDENT PROTEINS** July 22-27 Chairs: J.W. Suttie, University of Wisconsin, Madison; George Long, University of Vermont. **Expression of Recombinant and Transgenic Proteins.** G. Long, B. Yan, W. Velander, R. MacGillivray; **Genetic Disorders.** E. Davie, P. Jagadeeswarren, R. Bertina; **Carboxylase.** K. Berkner, B. Furie, C. Vermeer, J. Suttie; **Role in Bone Metabolism and Tumor Metastasis.** P. Price, J. Lian, M. Fasco; **Biosynthesis.** P. Friedman, R. Wallin, S. Degen; **Protein/Protein and Protein/Phospholipid Interactions.** D. Fair, S. Krishnaswamy, P. Tracy; **Vitamin K Metabolism.** H. Thijssen, H. Okuda, K. Uchida; **Human Requirements and Clinical Aspects of Vitamin K.** M. Shearer, J. Sadowski, W. Hathaway, R. vonKries; **Structure and Ca++ Interaction.** J. Stenflo, A. Tulinsky, R. Hiskey.

 **FOLIC ACID, VITAMIN B-12 AND ONE CARBON METABOLISM** July 29-August 3 Chairs: Victor Herbert, Mt. Sinai School of Medicine; Rowena Matthews, University of Michigan. **Novel Roles.** R. Matthews, G. Sancar, S. Clarke, J. Finkelstein; **In Anaerobes.** S. Ragsdale, J. Ferry, H. Wood, L. Ljungdahl; **Thymidylate Synthetase and Dihydrofolate Reductase.** D. Matthews, J. Kraut, J. Appleman, S. Benkovic; **De Novo Purine Biosynthesis.** L. Schirch, R. MacKenzie, C. Caperelli; **Enzymes as Targets for Therapy.** J. Bertino, J. Houghton, F. Huennekens, H. Calvert; **Neurobiochemistry and Metabolism.** R. Green, J. Scott, J. Metz, D. Jacobsen, S. Kaufman, I. Chanarin; **Polyglutamate Forms of Folate and Antifolates.** B. Shane, A. Bogner, C. Allegre, J. Galivan; **Vitamin Delivery.** R. Allen, J. Kolhouse, P. Elwood, D. Jacobsen, N. Berliner; **Determination of Status Abnormalities.** V. Herbert, M. Friedman, S. Stabler, B. Cooper, K. Das.

 **CHROMOSOME REPLICATION AND SEGREGATION IN YEAST** August 5-10 Chairs: Carol Newlon, UMDNJ-New Jersey Medical School; Philip Hieter, Johns Hopkins University; Douglas Koshland, Carnegie Institute of Washington. **DNA Replication - cis-Acting Elements and Associated Proteins.** V. Zakian; **- Biochemistry and Enzymology.** P. Burgers; **- Origin Usage and Temporal Control.** W. Fangman; **Chromosome Segregation - cis-Acting Elements and Associated Proteins.** J. Carbon; **- Mitotic Apparatus.** B. Byers; **- Nuclear and Chromosomal Architecture.** S. Gasser; **- Mutational Analysis of Transmission.** V. Larionov; **Cell Cycle Control - G1/S.** S. Reed; **- G2/M.** A. Murray.

RESEARCH CONFERENCES

INTESTINAL LIPID ABSORPTION, METABOLISM AND TRANSPORT August 12-17 Chairs: Charles M. Mansbach II, University of Tennessee; Patrick Tso, Louisiana State University Medical Center. **Overview at Age Extremities.** B. Borgstrom, S. Sabesin, O. Koldovsky, P. Holt; **Phospho- and Neutral-Lipid Hydrolysis.** J. Patton, G. Scheele, M. Hamosh, R. Verger, E. Dennis, C. Erlanson-Albertsson; **Intestinal Uptake of Cholesterol, Bile and Fatty Acids.** M. Carey, A. Hofmann, A. Thomson, N. McIntyre; **Intracellular Neutral Lipid Metabolism and Transport Regulation.** P. Tso, R. Ockner, L. Dawidowicz, C. Mansbach; **Intestinal Neutral Lipid Synthesis.** C. Mansbach, A. Kukis, R. Coleman, F. Field, A. Nilsson; **Apolipoprotein Synthesis & Regulation and FABP Structure.** J. Gordon, J. Sacchettini, N. Davidson; **Cholesterol, Lipid Soluble Vitamins, and Xenobiotics.** S. Clark, J. Dietschy, D. Hollander, J. Barrowman, D. Kritchevsky, C. Roy; **Physiological Regulators.** D. Kritchevsky, T. Brasitus, E. Feldman, S. Clark, W. Connor; **Non-Lymphatic Lipid Transport.** J. Barrowman, N. Granger, G. McDonald, D. Saunders, T. Redgrave.



Copper Mountain, Colorado

PROTEIN FOLDING AND ASSEMBLY IN THE CELL June 24-29 Chairs: Mary-Jane Gething, University of Texas HSC/Dallas; Jonathan King, MIT. **Structural Determinants: Theoretical and In Vitro Studies.** G. Rose, T. Creighton, P. Kim; **Genetic Studies: In Vitro and In Vivo.** R. Sauer, J. King, D. Shortle, D. Goldenberg; **Involved Cellular Proteins I.** F. Schmid, C. Georgopoulos, W. Wickner; **Protein Translocation Across Membranes.** L. Randall, L. Gierasch, R. Schekman; **Involved Cellular Proteins II.** R. Freedman, J. Sambrook, R. Hallberg, W. Neupert; **Intracellular Transport.** M. Gething, C. Machamer, J. Fessler; **Heteromeric Multisubunit Complexes.** L. Hendershot, R. Klausner, M. Goldberg; **Peptide Binding.** A. Townsend, T. Jardetsky, J. Rothman, B. Pearce; **Misfolding, Aggregation and Intracellular Degradation.** A. Mitraki, A. Goldberg, J. Dice, J. Lippincott-Schwartz.



Fc RECEPTORS AND IMMUNOGLOBULIN BINDING FACTORS July 1-6 Chairs: Wolf Fridman, Curie Institute, Paris; Jay Unkeless, Mt. Sinai Medical School. **Keynote Addresses: Characteristics of Ig-Supergenes.** A. Williams. **X-ray Crystallography of Ab-Ag Complexes.** D. Davies; **Molecular Genetics.** J. Unkeless, J. Ravetch, M. Hogarth, J. Kinet, J. Kochan; **FcεRI and Basophils and Mast Cells.** H. Metzger, M. Plant, J. Oliver, M. Beaven, L. Lichtenstein; **FcγR Function and Signalling.** B. Perussia, L. Lanier, P. Capel, S. Greenberg, R. Kimberly; **Ig Binding Factors and Signalling.** W. Fridman, C. Sautes, C. Anderson, T. Waldschmitt, J. Teillaud, R. Coico; **FcγRII Structure and Function.** G. Delespesse, J. Yodoi, H. Kikutani, D. Conrad, M. Sarfati, M. Kehry; **Poster Session.** C. Anderson and M. Daeron; **Immunotherapy and Pathology.** D. Segal, M. Fanger, J. Levy, J. Unkeless, C. Grose, J. Gergely; **IgA, IgM, and IgD Fc Receptors.** R. Lynch, L. Shen, B. Boyle, M. Cooper; **Transport of Ig.** K. Mostov, N. Simister, I. Mellman, E. Sztul.



REGULATION OF GENE EXPRESSION IN HIGHER ANIMALS July 8-13 Chairs: Michael Karin, University of California/San Diego; Helen Blau, Stanford University School of Medicine. **Keynote Address: Transgenic Animals.** R. Palmiter; **Hormonal Regulation.** R. Evans, K. Yamamoto, M. Montminy; **Transcription and Protein-Protein/Protein-DNA Interactions.** M. Karin, B. Roeder, G. Felsenfeld, M. Green; **Liver and Pancreas.** G. Schutz, R. Cortese, U. Schibler, D. Hanahan; **Mesodermal Gene Expression.** H. Blau, H. Weintraub, J. Changeux, W. Gilbert; **Cytokines and Growth Factors in Cellular Regulation.** G. Crabtree, I. Dawid, T. Taniguchi, R. Derynck; **Positional Information and Inducers in Development.** J. Gurdon, B. Hogan, E. DeRobertis, D. Solter; **Pattern Formation and Morphogenesis.** W. Gehring, R. Horovitz, G. Eichele, D. Wolgemuth; **Differentiation of Hematopoietic Cells.** D. Baltimore, I. Weissman, S. Orkin; **Neuronal Cell Fate and Gene Regulation.** C. Goodman, M. Raff, P. Patterson, J. Rubin.



STRUCTURE AND FUNCTION OF CELL MEMBRANES July 15-20 Chairs: Ronald McElhaney, University of Alberta; David Thomas, University of Minnesota. **Lipid Bilayer Organization.** T. Thompson, J. Nagle, M. Brown, J. Seelig; **Nonbilayer-Forming Lipids.** S.W. Hui, S. Gruner, R. Epand, R. McElhaney; **Membrane Proteins I and II.** M. Rafferty, F. Jahng, F. Prendergast, W. Hubbell, D. Thomas, A. Martinosi, T. Squier, R. Gennis; **Lipid Biogenesis and Movement.** H. Pownall, P. Devaux, R. Pagano, D. Daleke; **Lipid-Protein Interactions I and II.** P. Yeagle, S. Fleischer, L. Gierasch, E. Freire, B. Litman, D. Marsh, R. Mendelsohn, J. Boggs; **Membrane Fusion.** J. Silvius, J. Bentz, R. Blumenthal, P. Stahl; **Biological Studies.** R. McElhaney, P. Steponkus, J. Crowe.



PHYSIOLOGY AND PATHOPHYSIOLOGY OF THE SPLANCHNIC CIRCULATION July 22-27 Chairs: Albert P. Shepherd, University of Texas HSC/San Antonio; Ching-Chung Chou, Michigan State University. **Instrumentation and Techniques.** A. Shepherd, L.Y. Cheung, L. Taylor, A. Goodman, J. Kiel, H. Granger; **Developmental Aspects.** S. Bustamante, P. Nowicki, P. Gootman, K. Crissinger, I. Holzman; **Recent Advances.** C.C. Chou, R. Wechsler, P. Guth, G. Bohlen, W. Lutt; **Lymphatic Circulation.** H. Granger, J. Barrowman, J. Unthank, J. Benoit, P. Tso; **Oxygen-Derived Free Radicals.** D. Parks, K. Arfors, M. Grisham, M. Suematsu, A. Koo, H. Hiraishi; **Inflammatory Mediators on the Microvasculature.** M. Grisham, A. Lefer, M. Cybulski, J. Wallace, J. Spitzer; **Endothelial Cells.** D. Shepro, P. Kvietys, U. Ryan, G. Bulkley; **Leukocytes and Microvasculature.** D. Granger, A. Shepherd, D. Anderson, H. Lipowsky, G. Schmid-Schoenbein; **Ischemia and Multiple Organ Failure.** G. Bulkley, F. Moody, A. Marston, C. Greenway, D. Herndon, U. Haglund, T. Buchman.



HEPATIC REGENERATION AND CARCINOGENESIS: MOLECULAR AND CELLULAR PATHWAYS July 29-August 3 Chairs: George Michalopoulos, Duke University Medical Center; Alphonse Sirica, VA Commonwealth University. **Liver Carcinogenesis: In vivo Models.** H. Pitot, D. Sarma, E. Farber, M. Anderson, R. Hermann, J. Reddy, J. Popp; **Hepatocyte - Culture.** C. Guguen-Guillouzo, P. Cuzelian, H. Isom, L. Reid; **- Gene Insertion.** S. Thorgeirsson, B. Huber, D. Paul, D. Shafritz; **- Proliferation.** R. Zarnegar, G. Michalopoulos, T. Nakamura, W. McKeehan, N. Bucher, A. Ichihara, D. LaBrecque, T. Francavilla, J. Yager, H. Shinozuka; **Cell Lineages.** J. Grisham, R. Evarts, S. Strom, D. Hixson, A. Sirica, N. Marceau, S. Sell; **TGFβ and Hepatocytes.** B. Carr, R. Jirtle, W. Russell, T. Hayes.



PROTEIN PHOSPHATASES August 5-10 Chairs: Edmond Fischer, University of Washington; Shirish Shenolikar, University of Texas Medical School. **Hormonal Regulation of Types I and II.** Philip Cohen, W. Merlevede, Patricia Cohen, T. Haystead, W. Stalmans, G. Thomas, J. Wang, R. Kincaid, C. Klee, B. Hemmings, L. Pinna; **Regulators.** E. Fischer, A. Nairn, J. Woodgett, J. Goris, S. Shenolikar; **Okadaic Acid and Inhibitors.** P. Cohen, D. Brautigan, A. DePaoli-Roach, D. Hartshorne; **Cell Proliferation.** J. Maller, J. Doonan, M. Yanagida, E. Karsenti, L. Samelson; **Gene Expression.** T. Hunter, D. Virshup, D. Pallas, J. Corden, K. Arndt; **Tyrosine Phosphatases in Signal Transduction.** D. Brautigan, N. Tonks, T. Ingebritsen, H. Saito, B. Goldstein; **Keynote Address:** T. Hunt; **Diversity and Function.** L. Reed, D. LaPorte, H. Nimmo, S. Klumpp, J. Thorner.

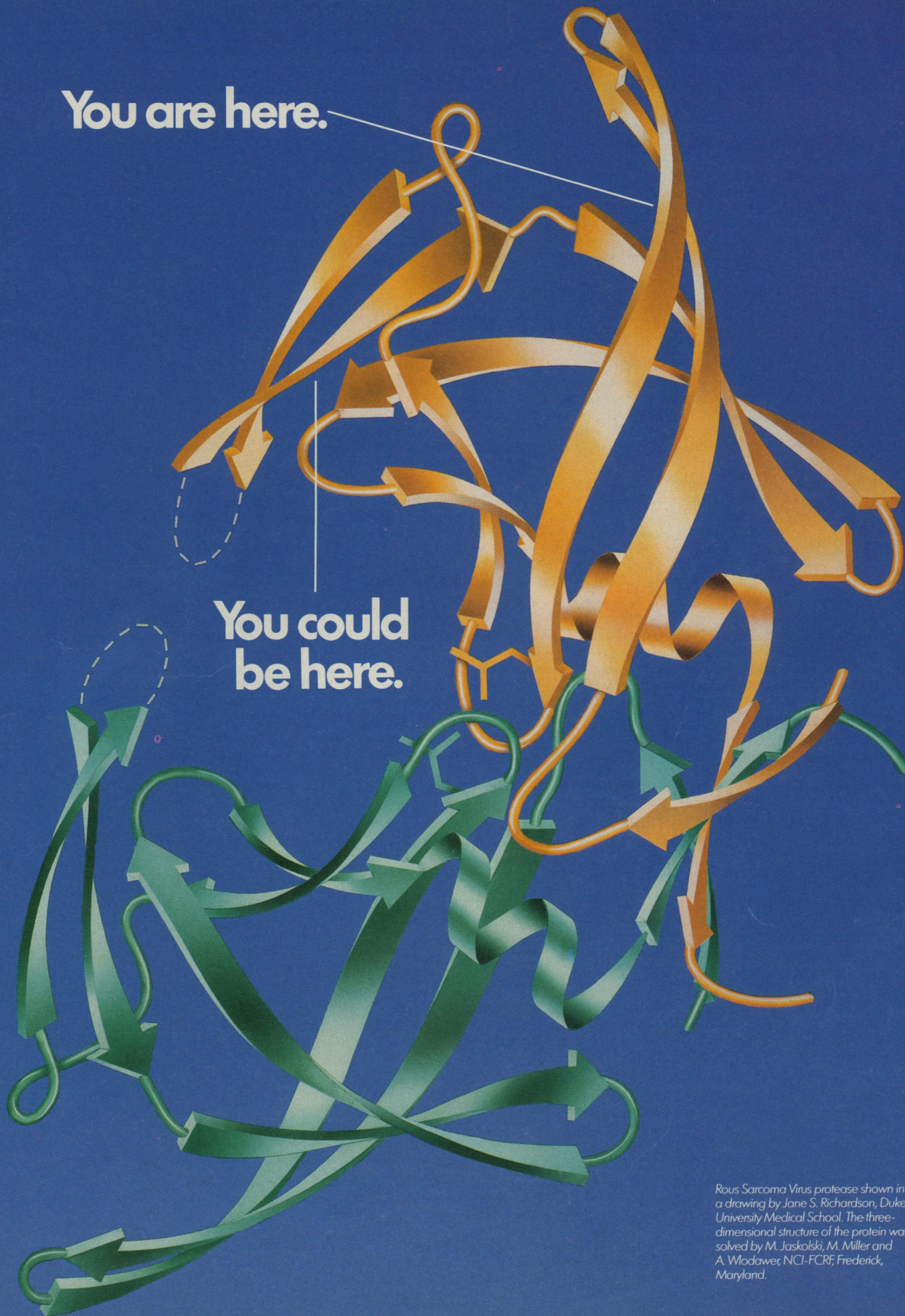


CELLULAR AND MOLECULAR GENETICS August 12-17 Chairs: Inder Verma, The Salk Institute/California; Kathryn Calame, Columbia University College of Physicians and Surgeons. **Developmental Biology.** T. Kornberg, C. Volhard, T. Jessel, J. Kimble, I. Herskowitz; **Techniques: Mouse Genetics.** E. Robertson, R. Beddington; **Differentiation.** S. Hauschka, C. Emerson, T. Graf, C. Sherr; **DNA Replication.** G. Wahl, B. Stillman, C. Prives, A. Spradling, J. Huberman; **Control of Transcription.** K. Calame, L. Stoudt, I. Verma, M. Green; **RNA Processing.** T. Cech, D. Hirsh, M. McKeown, P. Perlman; **Techniques: Physical Manipulation of the Human Genome.** D. Cox; **Cell Cycle Regulation.** T. Hunter, Y. Schlessinger, D. Beach, E. Krebs; **Oncogenes and Antioncogenes.** A. Levine, E. Harlow, D. Livingstone, A. Berns; **Neurobiology.** S. Heinemann, C. Zucker, M. Chalfie, R. Reed; **Human Genetics.** T. Caskey, F. Collins, D. Ward, P. Leder.



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Rous Sarcoma Virus protease shown in a drawing by Jane S. Richardson, Duke University Medical School. The three-dimensional structure of the protein was solved by M. Jaskolski, M. Miller and A. Wlodawer, NCI-FCRF, Frederick, Maryland.

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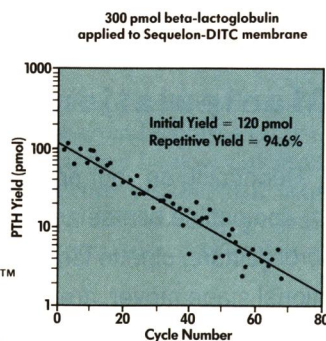


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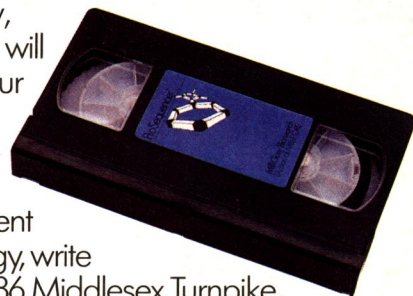
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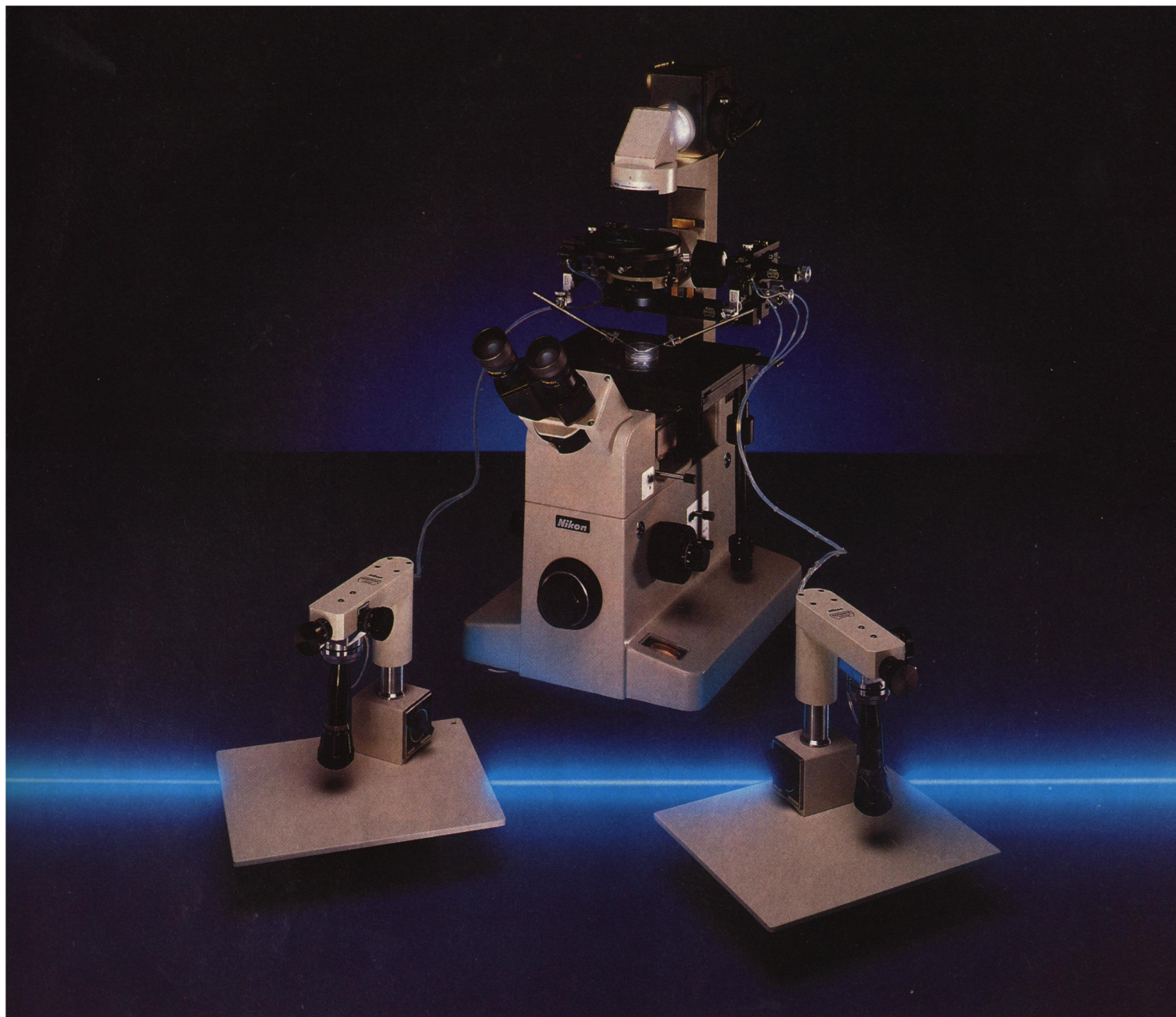
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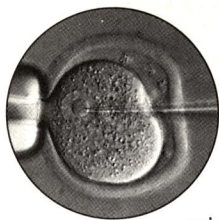
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Requests for applications to the Conferences, or for additional information, should be addressed to: Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Gordon Research Center, University of Rhode Island, Kingston, Rhode Island 02881-0801.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

Mail for the office of the Director from 11 June to 24 August 1990 should be addressed to: Dr. Alexander M. Cruickshank, Director, Gordon Research Conferences, Colby-Sawyer College, New London, New Hampshire 03257. Telephone: 603-526-2870/2871 or FAX: 603-526-4717.

Science of Adhesion

New Hampton School

J. M. Antonucci, chairperson; S. D. Senturia, vice chairman

13-17 August

L. Peebles, discussion leader
J. R. Griffith, "Functional fluoropolymers: Prospects and problems."
T. J. McCarthy, "Organic chemistry at fluoropolymer surfaces."
T. St. Clair, discussion leader
B. Ratner, "Surface characterization of complex polymer films."
S. A. Stanton, discussion leader
S. P. Pappas, "UV curable adhesives: Science, challenge and opportunity."
J. V. Crivello, "Applications of photo-initiated cationic polymerization in adhesives and release agents."
H. Chai, discussion leader
J. Israelachvili, "Effects of vapors and liquids on surface structure and adhesion."
M. G. Allen, discussion leader
D. S. Lashmore, "Effects of epitaxy on metal-metal adhesion."
G. A. Luoma, "Reduced surface preparation requirements for adhesive bonding."
R. A. Pike, discussion leader

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

D. L. Hunston, H. Mizumachi, "Mechanical properties and failure behavior of adhesives."

V. Thompson, discussion leader

S. Venz, "Chemical and physical aspects of dentin bonding agents."

T. A. Roberts, "Challenges in bioadhesives."

W. de Rijk, discussion leader

J. H. Waite, "Nature's designer glues and varnishes."

L. Sharpe, discussion leader

W. L. Wu, "A thermoacoustic technique for determining interface bonding strength in polymeric composites."

J. P. Bell, "Mercaptoester coupling agents for binding polymers to metals."

Analytical Chemistry

New Hampton School

E. Yeung, chairperson; J. Glajch, vice chairperson

6-10 August

I. Warner, discussion leader
B. Denton, "The role of modern array detectors in spectrochemical analysis."
R. Gijbels, "Micro- and trace analysis of solids: applications in material science and industry."
L. McGown, discussion leader
S. Terabe, "Electrokinetic chromatography for the thermodynamic study of molecular complexation."
L. C. Love, "Photophysics of micellar systems and cyclodextrin complexes."
R. Keller, discussion leader
A. Pines, "Recent advances in NMR."
J. Taylor, "Analytical applications of synchrotron radiation."
M. Arnold, discussion leader
O. Wolfbeis, "Fiber optic chemical sensors and enzyme-based biosensors."
D. Desiderio, discussion leader
K. Biemann, "Mass spectrometry in biochemical systems."
J. Fenn, "Electrospray ionization in mass spectrometry."
R. Smith, discussion leader
W. Hancock, "Analytical chemistry in biotechnology."
L. Smith, "Automated DNA sequencing and the analysis of the human genome."
T. Cotton, discussion leader
M. Majda, "Molecular assemblies at electrodes, dynamics of communication channels in organized monolayer and bilayer systems."
R. Murray, "Ultralow temperature electrochemistry and electrodes of

high T_c superconducting ceramics."

J. Robinson, discussion leader

J. Nagyvary, "Analytical chemistry and the Stradivarius."

S. Brown, discussion leader

S. Grossberg, "Electrical and chemical dynamics in learning, recognition, and memory of self-organizing neural networks."

S. Bialkowski, "Optical processing of analytical data."

Animal Cells and Viruses

Tilton School

S. McKnight and D. Forbes, co-chairpersons

18-22 June

Cell cycle regulation: J. Ruderman, D. Beach, G. vande Woude

Nuclear organization: D. Forbes, S. Gasser, J. Newport

Regulation of cell proliferation: D. Nathans, T. Curran, B. Sefton

RNA processing: J. Steitz, B. Sollner-Webb, A. Lamond, D. Rio

Protein transport: I. Mellman, R. Klausner, P. Walter, J. White

Signal transduction: K. Yamamoto, C. Zuker, H. Bourne

Cell differentiation: C. Emerson, I. Herskowitz, J. Gordon

Dynamics of cell shape: M. Sheetz, J. Spudich, G. Warren, S. Strome

Transcriptional regulation: A. Johnson, F. Winston, B. Wold

Atomic and Molecular Interactions

Salve Regina College

M. Alexander, chairperson; J. Valentini, vice chairperson

30 July-3 August

Molecular interactions at surfaces: B. Garrison, discussion leader

A. DePristo, "Corrected effective medium method for the determination of interaction potentials for atom- and molecular-surface systems."

B. Kay, "Influence of potential energy surfaces in scattering and desorption of small molecules from surfaces."

P. Bagus, "Ab initio cluster model studies of the interactions of atoms and molecules with surfaces."

van der Waals molecules: J. Lisy, discussion leader

M. Heaven, "Electronic spectroscopy of radical rare gas atom clusters."

D. Nesbitt, "Spectroscopic determination of potentials for three- and four-atom van der Waals systems."

Spin-orbit and nonadiabatic effects in spectroscopy and dynamics: P. Julienne, discussion leader

P. Kleiber, "Nonadiabatic effects in molecular collision dynamics by state resolved 'half-collision' techniques."

D. Yarkony, "The electronic structure aspects of spin-forbidden and electronically nonadiabatic processes."

B. Pouilly, "Retention of orbital alignment in molecular collisions."

Role of molecular potentials in molec-

IMPORTANT—PLEASE NOTE

Telephone: 401-783-4011/3372

FAX No. 401-783-7644; Bitnet Address: BCP101@URIACC

Fixed Conference Fees—1990

New Hampshire Conferences

Conferee (double occupancy)	\$360
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Nonresident Conferee (meals, no room)	\$320
(\$270 if postmarked 3 weeks prior to conference)	
Guest (room, meals)	\$270
(\$220 if postmarked 3 weeks prior to conference)	

Rhode Island Conferences

Conferee (double occupancy with bath)	\$375
(\$325 if postmarked 3 weeks prior to conference)	
Nonresident Conferee (meals, no room)	\$320
(\$270 if postmarked 3 weeks prior to conference)	
Guest (room with bath, meals)	\$285
(\$235 if postmarked 3 weeks prior to conference)	

European Conferences—Volterra, Italy

Conferee (double occupancy)	\$600
(\$550 if postmarked 3 weeks prior to conference)	

1) Full fixed fee charged regardless of time conferee attends Conference. Please note details of fees.

2) Fixed fees cannot be prorated or reduced for anyone (speakers, discussion leaders, and conferees).

3) Children under 12 years of age are not permitted in the meeting rooms, dining rooms, or dormitories at any host sites.

4) Nonresident conferees are expected to eat all meals in the Conference dining room and therefore the fee for nonresidents includes the full meal charge.

5) Offsite accommodations (hotel, motel, and so forth) near the host schools are available; however, early reservations are recommended. The office will send on request a list of outside housing for your information.

ular dissociation and reaction: H.-J. Werner, discussion leader

P. Dagdigan, "The $H+N_3$ reaction and photodissociation of HN_3 ."

K. Welge, "Photodissociation and reaction dynamics involving hydrogen atoms."

Molecular motion in clusters and at surfaces: G. Corey, discussion leader

W. Andreoni, "Ab initio molecular dynamics studies of small clusters."

A. Kleyn, "Scattering of oriented NO molecules by metal surfaces."

B. Gerber, "Molecular scattering from imperfect surfaces."

Potential energy surfaces: A. Wagner, discussion leader

S. Walch, "Ab initio potential energy surfaces for reactions of interest in combustion chemistry."

J. Hutson, "Determination of potential energy surfaces for van der Waals systems."

Nuclear motion in polyatomic molecules: T. Uzer, discussion leader

D. Pratt, "High-resolution spectroscopy of mixed states."

E. Sibert, "Obtaining rotation-vibration spectra with effective Hamiltonians."

D. King, "Dynamics of overtone-excited small molecules."

R. Watts, discussion leader

G. Scoles, "Intermolecular forces: To beat Lennard-Jones and common-sense you need more precision and effort than you think. But it is worth it."

Role of potential energy surfaces in molecular photodissociation: J. Valentini, discussion leader

T. Sears, "Infrared laser studies of photochemical reactions."

H.-P. Helm, "Photodissociation of excited states of H_3^+ ."

P. Sarre, "Laser photodissociation of diatomic and polyatomic ions."

Bacterial Cell Surfaces

Plymouth State College (N)

G. F.-L. Ames and S. Mizushima, co-chairpersons

2-6 July

Transport: R. Kaback, discussion leader

H. Shuman, Y. Anraku, G. LeBlanc, G. Robillard

Energetics: T. Krulwich, discussion leader

P. Dimroth, K. Postle, R. Simoni

Protein localization (I): P. Bassford, discussion leader

D. Oliver, C. Kumamoto, T. Silhavy, J. Beckwith, B. Holland

Pathogenesis and bacterial invasiveness: F. Heffron, discussion leader

M. So, B. Finlay, D. Portnoy

Protein localization (II): P. Tai, discussion leader

W. Wickner, L. Randall, H. Tokuda, T. Watanabe

Membrane assembly and lipid biogenesis: R. Simoni, discussion leader

C. Raetz, C. Manoil, M. Muller, R. Gunsalus

Transmembrane signaling: J. Parkinson, discussion leader

G. Hazelbauer, D. Koshland, M. Inouye, T. Mizuno, J. Thorner

Outer membranes and polysaccharides: H. Nikaido, discussion leader

S. Benson, T. Ferenci, J. Tommasen

Basement Membranes

Brewster Academy

J. Fessler, chairperson; H. Kleinman, vice chairperson

18-22 June

Protein and gene structure of basement membrane-related components I: J. Engel, discussion leader

Speakers: R. Timpl, M. Chiquet, K. Trygvasson

Discussants: D. Noonan, Y. Yamaguchi

Protein and gene structure of basement membrane-related components II: J. Fessler, discussion leader

Speakers: E. Engvall, M. Paulsson

Discussants: J. Kramer, P. Yurchenko

Cell receptors and growth factors in relation to basement membranes: H. Kleinman, discussion leader

Speakers: D. Cheresch, R. Mecham, A. Mercurio

Discussant: C. Damsky

Molecular biology of regulation: Y. Yamada, discussion leader

Speakers: B. DeCrombrughe, S. Burgeois

Discussants: P. Burbello, M. Hoffman

Development and growth regulation: B. Hogan, discussion leader

Speakers: D. DeSimone, L. Gudas, K. von der Mark

Discussants: R. Markwald, M. Bissel

Development and neurobiology: L. Reichardt, discussion leader

Speakers: J. Sanes, M. Tessiere-Levigne, C. Klamt

Discussant: J. McMahan

Thick and unconventional basement membranes: R. Burgeson, discussion leader

Speakers: T. Linsemayr, R. Kramer, D. Mosher

Discussant: L. Fessler

D. Branton, "Cortical cytoskeleton."

Pathological and other degradation of basement membranes: L. Liotta, discussion leader

Speakers: L.-B. Chen, L. Tudermann, G. Goldberg

Discussant: W. Stetler-Stevenson, R. Bukowski

Biocatalysis

Plymouth State College (N)

J. B. Jones and D. L. Anton, co-chairpersons; J. Frost and J. D. Rozzell, co-vice chairpersons

25-29 June

P. Peulsen, discussion leader

C. Sih, "Chiral lactone formation."

K. Kyler, "Chemoenzymatic synthesis."

M. Schneider, "Chiral synthesis."

J. Frost, discussion leader

H. Yamada, "Nitrile hydrolysis."

H. Shoemaker, "Amino acid production."

T. Lieb, discussion leader

C. Morrow, "Enzymatic polymerizations."

D. Rozzell, "Cis-muconic acid biosynthesis."

G. Whitesides, "Carbohydrate synthesis."

B. Rubin, discussion leader

F. Arnold, "Enzyme engineering for non-aqueous solvents."

J. Knowles, "Manipulative mutagenesis."

B. Jones, discussion leader

T. R. Kelly, "Bisubstrate reaction templates."

F. Stoddart, "Enzyme mimics to molecular self assembly."

A. Tramontano, "Catalytic antibodies."

D. Anton, discussion leader

A. Warshell, "Mutagenesis calculations."

A. Klibanov, "Irreversible enzyme inactivation."

G. Petsko, "Mandelate racemase, evolution of metabolic pathways."

C. Goodhue, "Pentaerythritol pathway."

K. Timmis, "Pathway engineering."

H. Dalton, "Methane mono-oxygenase."

J. Lipscomb, "Methane mono-oxygenase."

P. van Eikeren, "Membrane-assisted regeneration of NAD cofactors."

M. Lilly, "Engineering of poorly water soluble substrates."

C. Wandrey, "Enzyme reaction engineering."

Bioelectrochemistry

Proctor Academy

M. L. Swicord, chairperson; C. N. Rafferty, vice chairperson

23-27 July

Session I: Field effects on gene expression

R. Cadossi, discussion leader

H. Rasmussen, "Signal transduction and sequence of events in gene expression."

A. Henderson, "Overview of field effects on gene expression."

To be announced, "Stress responses and gene expression."

T. Tsong, discussion leader

C. Cain, "Overview of second messenger field effects."

C. Byus, "Second messengers—evidence of or lack of evidence of role of transcriptional events."

M. Marron, discussion leader

M. Schmid, "The role of supercoiling and nonreceptor-mediated responses in the regulation of gene expression."

T. Hsieh, "Kinetics of the topoisomerase."

To be announced, "Kinetics of the polymerase."

R. Korenstein, discussion leader

D. Kennell, "The kinetics of protein

synthesis and RNA degradation."

M. Blank, discussion leader

T. Litovitz, "The origins of windows in bioelectromagnetic effects in gene expression."

D. Astumian, "Field perturbation of the rate constant and the effect on enzyme catalyses."

E. Neumann, discussant—Gene expression.

Session II: Systemic responses of electric fields

A. Pilla, discussion leader

C. Rubin, "The normal processes of bone growth."

R. Aaron, "Overview of bone growth stimulation."

B. Siskin, "Overview of nerve regeneration."

M. Weissenseel, "Vibrating probe measurements and fields about cells."

R. Nuccitelli, "Endogenous ionic currents and fields in animal systems."

L. Jaffe, discussion leader

R. Borgens, "Effects of exogenous fields in animal systems."

To be announced, "Endogenous fields in plants—directed growth."

A. Chiabrera, discussion leader

H. Wachtel, "The magnitude of induced fields for various exposure conditions, is there enough?"

J. Weaver, "Lower limits of response of cell systems to external fields."

To be announced, discussant—Systemic responses.

Bioengineering and Orthopaedic Sciences

Proctor Academy

A. J. Grodzinsky, chairperson; D. Eyre, vice chairperson

6-10 August

M. Spector, discussion leader

J. Galante, "Tissue response to orthopaedic implants."

S. Goldring, "Cellular response to orthopaedic biomaterials."

L. Sandell, "Molecular biology: Mechanisms of cellular response."

J. Lewis, discussion leader

W. Landis, "Ultrastructure and mineralization of bone and other calcifying tissues."

S. Goldstein, "Mechanical influences on trabecular tissue adaptation."

J. Urban, discussion leader

E. Hunziker, "Ultrastructure of immature and mature cartilage."

H. Helminen, "Effect of mechanical loading on cartilage in vivo."

J. Sandy, "Mechanisms for control of cartilage matrix assembly."

A. Maroudas, discussion leader

T. Hardingham, "Biorheology of proteoglycans."

W. Comper, "Fluid flow through proteoglycans."

B. Caterson, discussion leader

D. Heinegard, "Bone and cartilage matrix constituents: Roles in function and remodeling."

S. Lohmander, "Synovial fluid cartilage markers and joint disease."

E. Thonar, "Serum keratan sulfate as a marker for proteoglycan catabolism."
D. Eyre, discussion leader
P. Bruckner, "In vitro models for collagen-connective tissue function."
F. Silver, "Collagen structure and mechanical properties of connective tissues."
S. Woo, discussion leader
W. Akeson, "Cell biology of ligament healing."
C. Frank, "Collagen remodeling in ligament scar tissue."
T. Koob, "The role of proteoglycan in tendon."
A. Grodzinsky, discussion leader
T. Laurent, "The physiology of hyaluronan—a biased overview."
D. Carter, discussion leader
J. Ogden, "Development and growth of a musculoskeletal system."
L. Lanyon, "Cellular responses to load bearing in bone."
M. Bolander, "Molecular approach to bone repair."

Biological Regulatory Mechanisms

Holderness School

L. Guarente and C. Gross, co-chairpersons

18–22 June

J. Thorner, discussion leader
H. Bourne, "The α subunits of receptor-coupled G-proteins can be oncoproteins."
S. G. Rhee, "Hormonal regulation of phosphoinositide-specific phospholipase C enzyme."
H. Varmus, discussion leader
P. Nurse, "Cell cycle control in *S. pombe*."
R. Erikson, "V-src and early events in growth induction."
S. Kustu, discussion leader
R. Tijan, "Species-specific promoter recognition by RNA pol1."
M. Susskind, "How sigma factors recognize promoters."
J. Gralla, "Sigma 54-dependent long-range transcription activation."
P. Sharp, discussion leader
M. Ptashne, "Acidic activation domains."
S. Hahn, "Molecular analysis of TFIID."
R. Axel, discussion leader
S. Prusiner, to be announced.
P. Howley, to be announced.
H. Echols, discussion leader
A. Wilson, "Evolution of mitochondrial DNA."
M. Rudman, "Evolutionary consequences of mismatch repair."
R. Losick, discussion leader
R. Haselkorn, "Genes required for heterocyst differentiation and pattern formation in *Anabaena*."
I. Herskowitz, to be announced.
L. Shapiro, "Control of asymmetry and spatial organization during caulobacter development."
R. Horvitz, discussion leader

J. Kimble, "Genetics of cell interactions in *C. elegans*."
Y. N. Jan, "Genes required for specifying cell fate in the *Drosophila* nervous system."
S. Lindquist, discussion leader
B. Craig, "Heat shock response in *S. cerevisiae*."
C. Gross, "Heat shock response in *E. coli*."

Biomolecular Recognition and Immobilization

Holderness School

I. Chaiken, chairperson; D. Litman, vice chairperson

6–10 August

Structural concepts in recognition: M. Amzel, chair
M. Amzel, "Conformational aspects of recognition of rigid and flexible small molecules."
E. Padlan, "Antibody and antibody: Antigen complexes as paradigms in macro-molecular recognition."
R. Klevit, "Structural studies of synthetic zinc finger motif."
J. Ponder, "The role of packing in protein structure and recognition."
Mechanisms of recognition on solid surfaces: J. Andrade, chair
J. Andrade, "Complex, multi-domain proteins at interfaces."
H. Nygren, "Antibody: Antigen interactions at interfaces."
C. Pidgeon, "Immobilized artificial membranes."
Identifying and designing interaction motifs: P. Kim, chair
P. Kim, "Specificity and stability of leucine zipper interactions."
V. Mizrahi, "Antisense oligonucleotides: Studies with HIV RNase H."
J. Omichinski, "Design of hydrophobic pattern recognition peptides."
Chimeric/novel affinity systems: R. Youle, chair
R. Youle, "Construction new proteins with potent and cell type-specific toxicity."
D. Fitzgerald, "Bioactivity of recombinant toxin conjugates made by gene fusion."
R. Brentani, "Complementary hydrophobicity in protein interactions and applications to receptor isolation."
Antibody engineering: T. Rees, chair
T. Rees, "Antibody combining sites: Structure and design."
A. Tramontano, "Catalytic monoclonal antibodies."
J. Huston, "Single chain antibodies."
Enzyme engineering and immobilization: A. Klibanov, chair
A. Klibanov, "Enzymes and artificial receptors in organic solvents."
D. Clark, "Structural and functional heterogeneity of immobilized enzymes."
J. Holbrook, "Progress in altering recognition in dehydrogenases."
Biosensors and affinity diagnostics: D. Litman, chair
D. Litman, "Affinity diagnostics overview."
C. Lowe, "Accomplishments in biosensors."

J. Briggs, "Silicon-based sensors for proteins and nucleic acids."
J. O. Noell, "Conductive polymer-mediated sensors."
Understanding, design and applications of biomolecular recognition: J. Bonaventura, chair
J. Bonaventura, "Introduction."
C. Milstein, to be announced.
Affinity therapeutics: M. Wilchek, chair
M. Wilchek, "Cis-platinum biopolymer conjugates."
S. Petteway, "Molecular opportunities in anti-infectives."
J. Gershoni, "Mimic binding sites as therapeutics."
Posters are encouraged. Submit abstracts with your application to Daniel O'Shannessy, SmithKline Beecham, L-47, P.O. Box 1539, King of Prussia, PA 19406. Acceptance is subject to review.

Biopolymers

Salve Regina College

M. D. Barkley and B. Honig, co-chairpersons

18–22 June

DNA structure and curvature: P. Hagerman, discussion leader
K. Breslauer, C. Frederick, B. Reid, J. Shlomai.
Protein sequences and structures: J. Thornton, discussion leader
R. Fine, J. Novotny, C. Sander, W. Taylor.
RNA structure and RNA protein interactions: I. Tinoco, discussion leader
W. M. Huang, D. Moras, A. Pardi, J. Szostak.
Membrane proteins: D. Engelman, discussion leader
R. Henderson, W. Hubbell, D. Oesterhoelt.
Forces and energies: P. Rossky, discussion leader
A. Fersht, S. Gill, J. Hermanns, K. Sharp.
Water structure around macromolecules: W. Hendrickson, discussion leader
R. Dickerson, M. Levitt, B. Schoenborn, K. Wuthrich.
DNA protein interactions: P. Sigler, discussion leader
S. Harrison, R. Kaptein, P. Wright.
New imaging methods: V. Bloomfield, discussion leader
V. Elings, L. Jelinski, T. Jovin, G. Ruben.

Cancer

Salve Regina College

W. K. Cavenee, chairperson; R. Kerbel, vice chairperson

13–17 August

Plenary lecture: A. G. Knudson, Jr., "Genetics of cancer."
Molecular approaches to chromosome rearrangements: G. Brodeur, chairperson
J. Trent, "The 6q deletion in melanoma."

S. Korsmeyer, "The 14;18 translocation in follicular lymphoma."
G. Brodeur, "The *N-myc*-amplified domain in neuroblastomas."
Genetics of predisposition: R. White, chairperson
R. White, "Predisposition to colon carcinoma."
M. Nordenskjold, "Genetics of multiple endocrine neoplasia."
D. Housman, "Predisposition to Wilms' tumor."
Genetics of progression: W. Cavenee, chairperson
E. Fearon, "Progressive alterations in colon carcinoma."
A. Balmain, "Genetic alterations in murine skin carcinogenesis."
Y.-K. Fung, "Alterations of the *RB1* gene in breast tumor progression."
Genetic mechanisms: W.-H. Lee, chairperson
W.-H. Lee, "Molecular basis of tumor suppression by the *RB1* gene."
F. McCormick, "Role of the *ras* and *gap* family in signal transduction."
M. Karin, "Positive and negative interaction between members of the *jun/fos* family."
Somatic cell genetics: B. E. Weissman, chairperson
J. C. Barrett, "Hamster cell variants for tumor suppressor function."
H. P. Klinger, "Suppressors of tumorigenicity."
L. Sachs, "Cell differentiation and tumor suppression."
B. E. Weissman, "Genetics of tumor suppression in pediatric cancers."
Epigenetics: C. Sapienza, chairperson
D. Solter, "Genomic imprinting and mammalian development."
R. D. Nicholls, "Prader-Willi and Angelman syndromes: Both parental chromosomes 15q11q13 are necessary for normal human development."
C. Sapienza, "Genetics of genome imprinting."
Genetics and development: G. Vande Woude, chairperson
G. Vande Woude, "Mos protooncogene function."
L. Parada, "Protooncogene expression in developing murine nervous system."
T. Curran, "Protooncogenes *fos* and *jun* function as transcriptional regulators in nuclear signal transduction."
D. Melton, "Role of peptide growth factors in early *Xenopus* embryonic induction."
Genetics of metastasis: R. S. Kerbel, chairperson
R. S. Kerbel, "Growth dominance of the metastatic cancer cell."
J. Johnson, "Ectopic gene expression in human melanoma."
P. Steeg, "Role of nm23 suppressor gene in metastasis."
L. Liotta, "Novel collagenase inhibitory proteins which block invasion."
Clinical significance: R. C. Seeger, chairperson
R. C. Seeger, "*N-myc* in neuroblastoma."
D. Slamon, "Alterations of *Her2/neu* in human malignancy: Diagnostic and

therapeutic significance."

A. L. Murphee, "Clinical applications of the retinoblastoma gene."

Catalysis

Colby-Sawyer College (N)

B. C. Gates, chairperson; G. Lester, vice chairperson

25-29 June

Y. Iwasawa, "New metal-dimer catalysts and metal-assisted catalysis."

J.-M. Basset, "Use of surface organometallic chemistry to prepare new bimetallic catalysts."

J. Ekerdt, "Organometallic routes to metal oxide overlayers; models of oxide catalysts."

L. Manzer, "Recent developments in the catalytic synthesis of chlorofluorocarbon alternatives."

J. Geus, "Scientific based development of industrial catalysts."

Y. Moro-oka, "Highly functionalized catalytic materials for the selective oxidation of hydrocarbons."

V. Durante, "Vapor-phase catalytic hydroxylation of methane."

J. Kolts, "Catalytic formation of olefins from light paraffins."

J. Brazdil, "Selective ammoxidation of propane to acrylonitrile."

S. M. Fung, "Redispersion chemistry as a key to catalyst regeneration processes: Supported noble metal catalysts."

A. Peters, "Zeolite selectivity effects in hydrocarbon conversion associated with isolated and pair sites."

M. Boudart, "Assisted design of catalysts."

F. G. Dwyer, "The evolution of cracking catalysts and the challenge of the future."

K. Gibson, "Future trends in residuum hydroprocessing catalyst development."

Catecholamines

Proctor Academy

C. O. Rutledge, chairperson; J. P. Perkins, vice chairperson

30 July-3 August

P. Sternweis, discussion leader

W. P. Hausdorf, "Structural determinants of beta-adrenergic receptor function."

E. Parker, "Interaction of adrenergic/cholinergic chimeric receptors with G-proteins."

J. Kurjan, "Receptor/G-protein coupling in yeast."

P. Sternweis, "G-proteins: Structure and function."

T. K. Harden, discussion leader

T. K. Harden, "G-protein-regulated phospholipase C."

J. H. Exton, "Role of phospholipids in hormone action."

A. M. Brown, "Agonist-free receptors and their effects on ion channels."

J. P. Perkins, discussion leader

J. P. Perkins, "Evidence for ligand-induced receptor endocytosis."

R. B. Clark, "Multiple roles of protein kinases in receptor desensitization."

C. C. Malbon, "Regulation of beta-adrenergic receptor mRNA expression."

P. B. Molinoff, discussion leader

P. B. Molinoff, "Properties and regulation of dopamine D₂ receptors in cultured cells."

S. J. Watson, "Site-specific expression and regulation of dopamine D₂ receptors."

J. Shine, "Molecular analysis of the human dopamine D₂ receptor subtype."

M. J. Zigmond, discussion leader

M. Raiteri, "The catecholamine transporter: A route for transmitter release?"

M. J. Kuhar, "Characterization of the dopamine transporter."

E. Abercrombie, "The influence of high affinity uptake in determining extracellular catecholamine concentrations."

R. E. Heikkila, discussion leader

P. K. Sonsalla, "Mechanistic features of MPTP-induced dopaminergic neurotoxicity."

J. W. Gibb, "Role of dopamine in the toxicity of amphetamine-like compounds."

M. J. Zigmond, "Compensatory responses to 6-hydroxydopamine-induced damage to the nigrostriatal bundle."

C. O. Rutledge, discussion leader

M. L. Dubocovich, "Presynaptic modulation of catecholamine release."

R. M. Wightman, "Possible quantal release of catecholamines."

L. X. Cubeddu, "Adaptive presynaptic mechanisms in the regulation of dopamine release."

R. W. Holz, "Control of exocytosis of catecholamines from chromaffin cells."

B. J. Hoffer, discussion leader

B. S. Bunney, "Central dopaminergic functioning: A new hypothesis."

D. J. Woodward, "Neural circuit actions of catecholamines."

D. B. Calne, discussion leader

D. B. Calne, "Selective neuronal degeneration in the normal and abnormal elderly."

L. J. Siever, "The role of catecholamines in the etiology of affective disorders."

D. S. Goldstein, "PET scanning of sympathetic innervation and function."

Poster presentations will be accepted.

Solid-State Studies in Ceramics

Kimball Union Academy

T. A. Michalske, chairperson; M. Harmer, vice chairperson

13-17 August

J. R. Smith, discussion leader

P. W. Tasker, "Bonding at metal ceramic interfaces."

W. Lambrecht, "Interfacial energies in ceramic composites."

D. Clark, discussion leader

W. Mader, "HTEM studies of the metal/ceramic interface."

F. Ohuchi, "Chemical bonding at the metal/ceramic interface."

A. Hever, discussion leader

P. Pirouz, "Structure of SiC interfaces."

C. Pantano, "Chemical stability of the SiC/SiO₂ interface."

A. G. Evans, discussion leader

J. Hutchinson, "Micromechanics of interfacial failure."

M. Thouless, "Model studies of interfacial failure."

R. Cooke, discussion leader

R. Horn, "Bonding between dissimilar oxide surfaces."

J. B. Pethica, "Forces and nanomechanics at surfaces."

E. R. Fuller, discussion leader

D. Marshall, "Failure processes in ceramic composites."

R. Ritchie, "Fatigue of ceramic interfaces."

R. Cannon, discussion leader

R. Cammarata, "Super modulus effects in thin-film composites."

J. Currey, "Mechanical properties of biological composites."

R. Loehman, discussion leader

T. Shaw, "Liquid-induced grain boundary decohesion."

J. Blakely, "Impurity effects on surface and interface transport."

Chemical Senses: Taste and Smell

Plymouth State College (S)

B. P. Halpern, chairperson; D. L. Hill, vice chairperson

16-20 July

G. D. Burd, discussion leader

P. Brunjes, "Experience and the developing olfactory bulb."

P. P. C. Graziadei, "The olfactory system in neurobiological research: How we can study the nose to understand the brain."

P. S. Lasiter, "Peripheral interactions with central gustatory development."

R. Norgren, discussion leader

M. Kalla, "Organization of the nucleus of the tractus solitarius: Topography, connections and chemical neuroanatomy."

D. V. Smith, "Differential gustatory inputs to the solitary nucleus."

S. P. Travers, "Orosensory organization in the solitary nucleus."

B. W. Jafek, discussion leader

L. M. Bartoshuk, "Taste disorders: A window into taste mechanisms."

G. K. Beauchamp, "Clinical research and the functions of the chemical senses."

M. M. Mozell, "Human olfactory disorders: They can influence how we think about olfaction."

J. G. Hildebrand, discussion leader

J. Caprio, "Chemoreception of amino acids by aquatic organisms: Are mechanisms similar?"

T. Eisner, "Chemical basis of sexual selection in insects."

R. J. O'Connell, "Direct and indirect gating of single channel currents in chemoreceptors."

G. H. Gold, discussion leader

J. A. DeSimone, "Mechanisms of chemosensory transduction: What can we learn from integrated and reductionist approaches?"

K. Kurihara, "Does cation influx through receptor membranes contribute to the receptor potentials in all animals?"

D. Lancet, "Do signal terminating enzymes contribute to chemosensory information processing?"

M. O'Mahoney, discussion leader

J. Atema, "Sampling the chemical environment with high spatial-temporal resolution: Odor signals, receptor cells, and behavior decisions."

H. T. Lawless, "Sensitivity, intensity, and temporal aspects of human chemosensory perception."

M. Meredith, discussion leader

J. E. Schwob, "Do biochemically defined subclasses of olfactory sensory neurons differ in their odorant selectivity?"

B. M. Slotnick, "Olfactory perception of rats with lesions of olfactory bulb areas associated with high 2-DG uptake."

W. B. Stewart, "Functional, anatomical and biochemical heterogeneity of glomeruli in the olfactory bulb."

G. M. Shepherd, discussion leader

M. Konishi, "Are visual or auditory models for CNS separation of peripherally combined intensity and quality inputs applicable to olfaction and taste?"

M. Halpern, discussion leader

C. D. Derby, "Simple and complex odorant mixtures and the spiny lobster: Identification of relevant stimulus features and the importance of mixture interactions in olfactory discrimination."

R. P. Erickson, "The mind of the scientist: Making research give the right answers."

J. R. Mason, "Ecological context: Species differences in chemosensory capacity and application to animal damage control."

Chemotherapy of Experimental and Clinical Cancer

Colby-Sawyer College (S)

W. E. Ross, chairperson; M. Colvin, vice chairperson

16-20 July

Therapeutic prospects of monoclonal antibodies: A. F. LoBuglio, discussion leader

I. Pastan, "New toxic agents created by the fusion of cell recognition and toxin genes."

E. S. Vitetta, "Immunotoxins in the treatment of lymphoma."

S. L. Morrison, "Functional properties of genetically engineered antibody molecules."

DNA repair inhibitors as biochemical modulators: B. Teicher, discussion leader

L. C. Erickson, "The use of DNA repair inhibitors to increase tumor cell killing by cisplatin and carboplatin."

S. L. Gerson, "Modulation of O⁶ alkylguanine-DNA alkyltransferase in ni-

tro surea resistance."

Cell death: J. Hickman, discussion leader

A. Wyllie, "Apoptosis: Intracellular mechanisms."

J. T. Isaacs, "Therapeutic implication of programmed cell death for prostatic cancer."

R. T. Schimke, "Cell death and disassociation of cell cycle progression."

Cellular response to DNA damage: A. B. Pardee, discussion leader

A. J. Fornace, "DNA damage inducible genes in mammalian cells and their expression in drug-resistant tumor cells."

R. Lock, "The role of mammalian cdc2 kinase in antitumor drug-induced G2 arrest and cell death."

New targets, new agents: W. E. Ross, discussion leader

M. S. Wicha, "Mammastatin: A tissue-specific inhibitor of breast cancer cell growth."

D. Von Hoff, "Extrachromosomal DNA as a mechanism for drug resistance and tumor progression."

P. J. Houghton, "Antitumor diarylsulfonyleureas: Novel agents which may identify new molecular targets."

W. E. Ross, discussion leader

Poster discussion

Topoisomerase as drug targets: W. T. Beck, discussion leader

L. A. Zwelling, "Mechanisms of resistance to topoisomerase II reactive drugs."

J. C. Wang, "Eukaryotic DNA topoisomerases as targets of anticancer drugs."

D. J. Fernandes, "Nuclear matrix topoisomerases II and multidrug resistance."

K. Tew, discussion leader

T. Tritton, "Debate on public policy on cancer research."

R. Johnson, to be announced

Multidrug resistance: S. B. Horwitz, discussion leader

J. Croop, "Characterization of genes in the *Drosophila* multidrug-resistant gene family: Evolutionary considerations."

H. Pinedo, "Functional screening for multidrug-resistant cells in human malignancies."

CO₂ Fixation of Green Plants

Colby-Sawyer College (S)

R. G. Jensen, chairperson; B. Osmond, vice chairperson

23-27 July

W. Ogren, discussion leader

T. Lundqvist, "Inhibitor binding to Rubisco studied by x-ray crystallography."

F. C. Hartman, "Rubisco activity and biochemistry of the specificity factor."

S. Hemmingsen, "Higher plant Rubisco assembly in *E. coli*."

G. Bowes, discussion leader

M. E. Salvucci, "Photoaffinity labeling of Rubisco and Rubisco activase."

R. J. Spreitzer, "*Chlamydomonas* nuclear mutations influence the CO₂/O₂ specificity."

G. E. Edwards, discussion leader

T. Nelson, "Development of C₄ leaves."

H. J. Bohnert, "Molecular development of CAM."

U. I. Flugge, "Molecular properties of chloroplast phosphate translocators."

D. D. Randall, discussion leader

D. J. Oliver, "Glycine decarboxylase complex: A light-induced mitochondrial protein."

L. McIntosh, "The alternate oxidase: Structure and function."

C. C. Black, discussion leader

R. Chollet, "Regulatory phosphorylation/dephosphorylation of C₄-leaf PEP carboxylase and pyruvate, Pi dikinase."

H. G. Nimmo, "Identification and characterization of the protein kinases and phosphatases that regulate PEP-Case in C₄ and CAM plants."

S. C. Huber, "Regulation of sucrose-P synthase by multisite phosphorylation."

E. Latzko, discussion leader

M. Stitt, "Use of plants with genetically manipulated enzyme activities to investigate the control of photosynthetic carbon metabolism."

M. D. Hatch, "Concentrating CO₂ for C₄ photosynthesis: Biochemical and biophysical requirements and compromises."

T. Sharkey, discussion leader

J. R. Seemann, "Relating whole leaf photosynthesis and Rubisco regulation."

D. H. Turpin, "Photosynthesis and nitrogen utilization."

A. Laik, "Control of photosynthesis, from experiments towards a theory."

B. Osmond, discussion leader

M. R. Badger, "Molecular approaches to understanding the central role of the carboxysome in the cyanobacterial CO₂ concentrating mechanism."

J. R. Coleman, "The molecular biology of carbonic anhydrase expression in algae and higher plants."

J. A. C. Smith, "Transport and storage of malic acid in CAM plants."

Communications and Control in Complex Systems

Tilton School

D. Howland, chairperson; F. W. Giessler, K. L. Bellman, and D. Stegg, vice chairpeople

2-6 July

D. Howland, discussion leader

D. Howland, "Back to the future."

K. L. Bellman, "New challenges to our concepts of control."

F. E. Yates, "Control principles across physical and biological systems."

K. L. Bellman, discussion leader

G. Fleischmaker, "Critique for concepts of control."

O. Selfridge, "Changing control concepts in machine systems."

K. Kreitman, discussion leader

A. Garfinkle, "Examples of chaos."

G. Richardson, "Characteristics of systems with interconnecting feedback loops."

J. T. Dockery, "Applications of 'fuzzy sets' and chaos theory to real world problems."

F. W. Giessler, discussion leader

T. R. Rona, "Interactive loops in biological complex system behavior."

M. Berdino, "Cellular information transfer."

D. O. Walters, discussion leader

D. C. Snyder, "A computational solution to the 'data glut'."

N. D. Ludlow, "Transforming text into pictures."

K. L. Bellman, "The pitfalls of verbal description."

K. L. Bellman, discussion leader

E. Rosch, "Prototype theory of categorization."

D. O. Walters, "Is there a quantum mechanics model of the brain?"

L. D. Richards, discussion leader

W. M. Powers, "Control and communication in complex, dynamic, purposive systems."

J. Emory, "Organizational communications."

H. D. Colson, R. J. Strohl, "Cybernetic modeling."

A. K. Rachel, discussion leader

V. Hinshaw, "Dialectics of control."

Y. Yufic, "Knowledge measurement: Information-based diagnosis of cognitive skills."

L. Steg, discussion leader: Panel

J. A. Shaud, "What do we hear? Themes—strengths and limitations."

D. Steg, "What would we have liked to hear?"

J. G. Miller, "Important applications and the research needed to make it possible."

Complex Fluids

Volterra, Italy

C. R. Safinya and D. Roux, co-chairpersons

10-14 September

Polymers and gels:

P. G. Degennes, D. Pearson, S. J. Candau, J. Bastide, P. Pincus.

Liquid crystals and polymer liquid crystals:

J. D. Litster, R. S. Pindak, J. Prost, P. Pershan, D. Davidov, N. A. Clark.

Surfactant systems:

M. E. Cates, F. Nallet, J. Als-Nielsen, G. Porte, S. Safran.

Flow effects in complex fluids:

A. Onuki, R. Bruinsma, E. B. Sirota, D. Pine.

Exotic systems: Tethered membranes:

D. R. Nelson, S. Leibler, T. C. Lubensky.

Computational Chemistry

Plymouth State College (S)

W. L. Jorgensen, chairperson; J. M. McKelvey, vice chairperson

18-22 June

Molecular design: R. Cramer III, chair
G. Marshall, P. Gund, P. Bartlett.

Poster session

Biomolecular dynamics I: P. Kollman, chair

J. A. McCammon, O. Teleman, R. Levy, P. Wolynes.

Conformer searching/multiple minima problem: D. Boyd, chair

M. Saunders, H. Scheraga.

Ab initio quantum theory: K. Lipkowitz, chair

W. Hehre, K. Wiberg, K. Houk, W. Borden.

Poster session

Advanced computers and graphics: W. L. Jorgensen, chair

J. Wendeloski, P. Bash, K. Schulten, B. Brooks

Biomolecular dynamics II: D. L. Beveridge, chair

M. Karplus, M. Levitt.

Surfaces and solids: J. McKelvey, chair

B. Garrison, M. Whangbo.

Condensed Matter Physics

Brewster Academy

V. J. Emery, chairperson; A. Kaptulnik, vice chairperson

Strongly Correlated Electron Systems

11-15 June

B. Batlogg, "Critical summary of experiments on high T_c cuprates."

P. A. Lee, "Strong correlation approach to high T_c superconductors."

J. M. Tranquada, "Antiferromagnetic spin fluctuations in cuprate superconductors."

D. Jerome, "Organic superconductors: A low-dimensional correlated electron gas."

H. J. Schulz, "Organic and oxide superconductors."

Z. Fisk, "Current experimental knowledge of heavy electron ground states."

C. M. Varma, "Contrasting phenomenology of high T_c and heavy fermion materials."

G. Aeppli, "Neutron experiments to observe magnetic fluctuations in superconductors."

K. Levin, "The metallic copper oxides as almost localized Fermi liquids."

G. Sawatzky, "High-energy spectroscopy applied to highly correlated transition metal compounds."

N. Read, "Strongly interacting electrons in two dimensions."

V. B. Timofeev, "Spectroscopy in the quantum Hall effect regime."

S. A. Kivelson, "How to observe fractionally charged quasi particles."

P. Chaikin, "Quantum Hall effect in a bulk crystal."

D. M. Newns, "Are high T_c superconductors low-mass heavy fermion systems?"

M. Takigawa, "NMR in high T_c and other correlated electron systems."

D. J. Scalapino, "Monte Carlo simulations of strongly interacting electron systems."

Y. J. Uemura, "μSR studies of exotic superconductors."

Corrosion

Colby-Sawyer College (N)

R. Baboian, chairperson; N. Birks, vice chairperson

23-27 July

Localized corrosion: R. C. Newman, discussion leader

P. J. Moran, "New high spatial resolution techniques applied to localized corrosion of aluminum."

D. D. MacDonald, "Initiation of localized corrosion—new perspectives."

Velocity effects: S. T. Hirozawa, discussion leader

R. C. Alkire, "Velocity effects on localized corrosion."

E. Heitz, "Corrosion accelerated by mechanical damage from flow effects."

Coatings research: N. Birks, discussion leader

R. D. Granada, "Electrochemical properties of the organic coating/metal interface."

H. E. Townsend, "Corrosion mechanisms in painted metallic coated steels."

New materials research: B. F. Wilde, discussion leader

R. M. Latanision, "Corrosion resistance of new materials."

K. Doblhofer, "Electrochemical studies of adhesion properties of plasma polymer films."

Stress corrosion cracking: R. N. Parkins, discussion leader

T. R. Agladze, "The role of adsorption phenomena in mechanical corrosion processes."

D. J. Duquette, "Stress corrosion cracking of aluminum-lithium alloys."

Researching for corrosion resistance: A. J. Sedriks, discussion leader

B. MacDougall, K. Takahashi, M. J. Graham, "The role of anion adsorption in the inhibition of iron corrosion."

S. Ito, "Fundamental studies in the development of corrosion-resistant alloys."

Atmospheric corrosion: F. Mansfeld, discussion leader

G. R. Cass, "Characteristics of corrosive atmospheric environments."

S. W. Dean, "Environmental factors affecting atmospheric corrosion."

Topic of current interest: E. D. Verink, discussion leader

J. J. DeLuccia, "Corrosion and aging aircraft."

Analytical techniques: J. E. Payer, discussion leader

M. Keddam, "Application of the quartz microbalance and impedance spectroscopy to the study of generalized and localized corrosion."

G. G. Long, "Use of REFL-EXAFS to study the effect of alloying and processing on the structure of passive films."

Dielectric Phenomena

Holderness School

F. E. Karasz, chairperson; J. Bendler, vice chairperson

23-27 July

J. E. Anderson, discussion leader

C. A. Angell, "Relation between structure and nonexponential relaxation in liquids and glasses."

S. Sridhar, "Dielectric spectroscopy at gigahertz frequencies in liquids and solids."

M. L. Mansfield, "Dielectric relaxations of dilute polymer solutions with application to the poly(alkene sulfones)."

J. Bendler, discussion leader
Poster session.

W. J. MacKnight, discussion leader
F. Kremer, "Molecular dynamics in low molar mass and polymeric ferroelectric liquid crystals."

G. Williams, "Molecular dynamics and microscopic alignment behavior of liquid crystalline polymers as studied by dielectric relaxation spectroscopy."

J. M. O'Reilly, "Study of miscible and immiscible polymer blends by dielectric relaxation."

S. Matsuoka, discussion leader

R. H. Boyd, "Subglass dielectric relaxations in polymers."

H. Block, "Fluid flow, polarization and rheology."

P. K. Watson, discussion leader

E. E. Kunhardt, "Electron macro kinetics in liquids."

M. Abkowitz, "Electronic transport in polymeric insulators."

T. Mizutani, "High field phenomena in insulating polymeric films."

R. L. Fulton, discussion leader

P. Hedvig, "Dielectric and mechanical relaxation in cross-linked polymers."

S. Havriliak, "Dielectric relaxation and molecular dynamics."

G. Banhegyi, discussion leader

P. Pissis, "Dielectric studies of water in polymers and biopolymers."

R. Pethig, "Dielectric studies of protein-water interactions and associated proton transport processes."

D. Kell, "Linear and nonlinear dielectric properties of biological materials."

J. Hoffman, discussion leader

D. McCall, "National Commission on Superconductivity."

J. Pochan, discussion leader

J. K. Nelson, "A physical basis for the dielectric design of solid/liquid structures."

A. R. Tanguay, "The critical role of dielectric materials in optical information processing and computing devices."

G. Stegeman, "Nonlinear optical phenomena in thin films."

Drug Carriers in Biology and Medicine

Tilton School

J. N. Weinstein, chairperson; C. G. Gardner, vice chairperson

9-13 July

R. K. Jain, "Physiological barriers to the delivery of novel therapeutic agents."

G. Wilson, "Molecular mechanisms of trans-epithelial transport: Utility for drug delivery."

H. F. Lodish, "Endocytosis of cell surface receptors."

D. Papahadjopoulos, "Stealth liposomes: Prolonged circulation and enhanced uptake in tumors."

L. D. Leserman, "Intracellular delivery of antiviral oligonucleotides by antibody-targeted liposomes."

E. S. Kleinerman, "Therapy with MTP-PA liposomes: From laboratory to clinic."

E. S. Vitetta, "Immunotoxins: A decade later."

R. J. Youle, "Genetically engineered immunotoxins for cancer therapy."

D. J. P. Fitzgerald, "Recombinant CD4-toxin and growth factor-toxin chimeras."

E. Haber, "Current and future recombinant molecules that target plasminogen activators to antigens within a thrombus."

T. A. Waldmann, "The IL-2 receptor: A target for immunotherapy."

J. J. McGowan, "HIV, a new challenge for drug carriers—the NIAID AIDS Division's perspective."

G. Poste, "Challenges and opportunities in the clinical and commercial development of drug carriers."

C. T. Viswanathan, "Regulatory overview of drug carriers—the FDA's perspective."

M. Hashida, "Macromolecule-drug conjugates in targeted cancer chemotherapy."

J. Kopecek, "Tailor-made lysosomotropic polymeric drug carriers."

R. S. Langer, "Polymer carriers for drugs and cells."

S. Chamow, "Designing soluble CD4 analogs and CD4 immunoadhesins as anti-HIV therapeutics."

R. A. Lerner, "Modeling the antibody repertoire."

R. C. Mulligan, "Genetically modified cells as drug carriers."

There will also be a session for short presentations of selected posters and informal workshop for discussion of clinical results.

Drug Metabolism

Holderness School

S. K. Figdor, chairperson; G. T. Miwa, vice chairperson

16-20 July

Chirality: I. W. Wainer, chairperson

J. Gal, "Historical perspective."

T. Walle, "Stereochemistry in sulfoconjugation of chiral molecules."

J. Caldwell, "Influence of animal species on the stereochemistry of the metabolism and disposition of xenobiotics."

I. W. Wainer, "Effect of stereochemistry on the metabolism disposition and chemical efficacy of enantiomeric anticancer drugs."

Transgenic animals: P. Iannaccone, chairperson

J. W. Gordon, "Methotrexate resistance genes in transgenic mice."

P. Iannaccone, "Transgenic mice and chimeras, potential for drug me-

tabolism studies."

Pharmacokinetics: K. M. Giacomini, chairperson

K. M. Giacomini, "Pharmacokinetics of drugs transported by the renal organic cation/proton antiporter."

G. R. Wilkinson, "Pharmacokinetics and clinical consequences of polymorphic drug oxidation."

R. Levy, "Valproate, valpromide: A new class of exoxide hydrolase inhibitors."

Xenobiotic macromolecular adducts and sulfonylurea herbicide metabolism: N. E. Weber, chairperson

H. A. Kuiper, "In vitro studies of the mechanism of covalent binding and toxicity of furazolidone."

J. A. Anderson, "Comparative metabolism of three sulfonylurea herbicides."

Mass spectrometric developments: H. G. Fouda, chairperson

H. G. Fouda, "Atmospheric pressure HPLC tandem mass spectrometry, drug metabolism applications."

T. R. Covey, "Mass spectrometry of proteins and peptides."

R. H. Foltz, "Identification and quantitation of drugs and metabolites by ion trap mass spectrometry."

Biosensors: W. G. Miller, chairperson

W. G. Miller, "Real time determination of drug concentrations."

J. C. Owicki, "Pharmaceutical applications of the silicon microphysiometer."

P-450 today and tomorrow: S. D. Black, chairperson

S. D. Black, "Cytochrome P-450: Yet so many fundamentals to discover."

M. R. Waterman, "Salt, sex and stress: Steroid hydroxylases and the 90's."

T. L. Poulos, "Elements of P-450 structure and prospects for rational drug design."

Keynote presentation, to be announced.

Drug delivery strategies: G. T. Miwa, chairperson

V. J. Stella, "Testing drug targeting strategies via pharmacokinetic modeling: Applications to small molecule targeting via prodrugs."

D. W. Schneck, "Pharmacokinetics and pharmacodynamics of murine monoclonal antibody vinca alkaloid conjugates in patients with adenocarcinomas."

Dynamics of Simple Systems in Chemistry and Physics

Proctor Academy

W. P. Reinhardt, chairperson; J. Friar, vice chairperson

13-17 August

High- and low-energy physics, Coulomb crystals, and precision measurements in traps: D. Habs, D. Wineland, G. Gabrielse, R. Blumel.

Quantum and classical chaos in bound state and scattering systems: D. Kleppner, E. Heller, R. S. Berry, R. Skodje.

Few body scattering, including atomic and nuclear Coulomb and breakup

problems and the Berry phase: W. Sandhas, J. Briggs, C. Greene, H. Weller, W. Gloeckle, E. Redish, J. Payne, B. Zygelman.

Few body bound states including relativistic effects and mu-catalyzed fusion: J. Tjon, D. Beck, J. Morgan, H. Monkhurst, T. Very, C. Petitjean.

Electron Donor Acceptor

Salve Regina College

G. McLendon, chairperson; S. Farid, vice chairperson

20–24 August

A. English, discussion leader

B. M. Hoffman, "Electron transfer in protein complexes."

A. G. Sykes, "Determinants of protein electron transfer rates."

N. Kostic, "Reactions of copper proteins."

H. A. O. Hill, discussion leader

S. Boxer, "Photosynthetic charge separation."

M. Wasielewski, "Chemical models for photosynthesis."

A. Bard, "Scanning electrochemical microscopy."

C. Lieber, "STM as a chemical tool."

J. Frommer, "Tunneling microscopy for imaging and preparative microelectronics."

N. Lewis, "Electron transfer of semiconductor interfaces."

P. Alivisatos, "Preparation and properties of semiconductor clusters."

J. Verhoeven, discussion leader

A. Muentner, "Electron transfer at interfaces."

G. Schuster, "Chemistry of cyanine borates and imaging technology."

R. Nuzzo, "Electron transfer-initiated photopolymerization."

J. R. Miller, "Unsolved problems in electron transfer."

R. J. D. Miller, "Ultrafast interfacial electron transfer."

N. Hush, discussion leader

T. J. Meyer, "Multielectron redox reactions."

M. Gratzel, "Electron transfer in semiconductor clusters."

T. Mallouk, "Intramolecular electron transfer in porous solids."

H. Roth, discussion leader

A. G. Mauk, to be announced.

A. Nozik, "Hot electron tunneling at semiconductor interface."

E. Kosower, discussion leader

M. A. Fox, "Redox chemistry in organized semiconductor assemblies."

J. D. Porter, "Electron tunneling at electrochemical interfaces."

M. Calvin, "Energy conversion through solar chemistry."

Electron Spectroscopy

Brewster Academy

V. McKoy, chairperson; W. Eberhardt, vice chairperson

16–20 July

Magnetism and magnetic systems:

H. C. Siegmann, discussion leader

D. Pescia, "Spin-polarized electron

scattering from thin magnetic films."

M. Donath, "Spin-polarized inverse photoemission."

W. Gudat, "Spin-polarized core level photoemission."

Electron impact spectroscopy of molecules: L. Sanche, discussion leader

M. Allan, "Electron impact spectroscopy of molecules at low energies: Experiment."

M. A. P. Lima, "Electron impact spectroscopy of molecules at low energies: Theory."

High-resolution core level spectroscopy: F. J. Himpsel, discussion leader

N. Martensson, "Vibrational line shapes in core level photoemission."

C.-T. Chen, "High-resolution core electron spectroscopy."

F. P. Larkins, "Some recent developments in molecular Auger spectroscopy."

T. Tiedje, "Photoemission studies of GaAs/CaF₂ interface."

High-resolution angle-resolved photoemission studies: N. V. Smith, discussion leader

S. Kevan, "Coupling of phonons and low energy electronic excitations."

C. Olson, "Angle-resolved photoemission studies of high T_c superconducting materials."

New trends in photoelectron spectroscopy of molecules: J. Dehmer, discussion leader

M. G. White, "Laser-based methods for novel photoelectron spectroscopy."

K. Muller-Dethlefs, "Memory effects in molecular fragmentation upon site-specific 1s excitation observed by coincidence measurements."

K. Codling, "Multiphoton multielectron ionization of simple molecules via covariant mapping techniques."

Time-resolved photoemission studies of solids: J. Bokor, discussion leader

R. Haight, "Photoemission studies of semiconductor surfaces."

F. Meier, "Time-resolved photoemission using lasers."

Laser-based studies of surfaces: P. Feibelman, discussion leader

A. Liebsch, "Theory of nonlinear processes at surfaces."

E. W. Plummer, "Normal modes at the surface of metals."

H. Ishida, "Theory of alkali adsorption on metals."

Photoelectron holography: D. Shirley, discussion leader

J. Barton, "Photoelectron holography."

Surface structure determination: A. Bradshaw, discussion leader

K. Baberschke, "SEXAFS studies of chemisorbed oxygen."

K. Heinz, "Diffuse LEED investigation of O on Ni and other systems."

T. S. Rahman, "Theory of phonon modes at surfaces."

Electronic Processes in Organic Materials

Plymouth State College (N)

M. Pope, chairperson; L. B. Schein, vice chairperson

30 July–3 August

Carrier generation, recombination, transport: R. G. Kepler, discussion leader

C. L. Braun, "Geminate charge pairs in organic materials."

H. Scher, "Photogeneration in molecular systems: Theory."

N. Karl, "Sublinear carrier transport in nearly perfect organic crystals."

Carrier generation, recombination, transport: H. Bassler, discussion leader

C. B. Duke, "Electron localization and transport in molecular solids."

R. Kopelman, "Nanophotonics: Molecular exciton wires, dots, and scanning microscopy."

M. Abkowitz, "Electronic transport in Si and Ge backbone polymers."

Nonlinear optics: R. R. Chance, discussion leader

A. J. Heeger, "Nonlinear excitation and enhanced nonlinear optical properties of conjugated polymers."

R. Silbey, "Nonlinear optical properties of conjugated systems: Defects, disorder and conjugation lengths."

G. L. Baker, "Nonlinear optical devices from conjugated polymers."

G. C. Bjorklund, "Organic nonlinear optical materials for photonic applications."

Molecular electronics and sensors: H. C. Wolf, discussion leader

H. Inokuchi, "Single component organic semiconductors and their conductivity jump."

J. Simon, "Phthalocyanine radicals: The first intrinsic molecular semiconductors."

R. Birge, "Optically coupled molecular electronic devices."

R. Hughes, "Chemical sensors."

Contact charging—fundamental studies: L. B. Schein, discussion leader

J. Lowell, "Mechanism of contact charge transfer in solids."

K. Watson, "Role of electron and ion transport in Si and Ge backbone polymers."

B. Terris, "Electrostatic force microscopy."

Contact charging—powders: D. Burland, discussion leader

P. Julien, R. Kohler, "Xerographic toner charge spectroscopy."

J. Anderson, "Charging models for 2-component electrophotographic developers."

A. Diaz, "Ion transfer in contact electrification."

Chemical and physical stability of photoconductive materials: F. Willig, discussion leader

J. Pacansky, "Electrical fatigue of organic photoconductors by light exposure."

A. G. Macdiarmid, "Polyaniline: Chemical and physical basis for processibility."

D. Pai, "Chemical stability of organic xerographic photoconductor materials."

D. Weiss, "Surface injection in corona charged molecularly doped polymer films."

A. Rose, "The simplest and safest source of nuclear energy."

C. Tang, "Organic light-emitting diodes."

Special topics: M. Silver, discussion leader

A. J. Epstein, "Ferromagnetism and polarons in molecular solids."

M. Fayer, "Low-temperature glasses: Time scales in optical dephasing measurements."

G. J. Small, "Spectral hole-burning: Window on excited state structure and transport in photosynthetic units."

Chemistry of Energetic Materials

New Hampton School

T. B. Brill, chairperson; C. Capellis, vice chairperson

25–29 June

J. Boileau, discussion leader

J. Field, "Hot spot initiation mechanisms."

C. Mader, "Hydrodynamic initiation processes."

J. Nunziato, "Initiation and growth mechanisms."

R. Armstrong, discussion leader

D. Tsai, "Mechanisms of hot spot heating."

J. Sherwood, "Dislocations."

V. P. Verneker, discussion leader

J. M. McBride, "Early reaction intermediates in RDX."

R. Fifer, "Subsurface chemistry of extinguished propellants."

J. Oxley, "Reactions of nitrate esters."

R. McGuire, discussion leader

S. Rice, "High-pressure reaction measurements."

G. Piermarini, "High-pressure processes in energetic materials."

C. Capellos, discussion leader

C. Harris, "Reactions in the condensed phase on the femtosecond time scale."

D. Moore, S. Schmidt, "Spectroscopy in shock compression."

N. Holmes, "Spectroscopy in shock fronts."

S. Bulusu, discussion leader

R. Skocypec, "Fast transient gas and condensed phase chemistry."

N. Blais, "Detonation spectroscopy."

D. McMillen, discussion leader

G. McClelland, "Atomic dynamics of friction."

Y. T. Lee, "Radical-surface reactions."

B. Beard, "Spectroscopy of reacted surfaces."

B. B. Stokes, discussion leader

R. Becker, "High-resolution cinematography of burning surfaces."

K. Kuo, "Photographic analysis of propellants."

T. Edwards, discussion leader

F. Dryer, "Near surface gas/solid chemical reactions."

J. Stufflebeam, "Near surface CARS of propellant flames."

T. Parr, "PLIF in laser ignition."

Environmental Sciences: Water

New Hampton School

R. A. Hites, chairperson

Transport and Transformations of Pollutants

18–22 June

Chemical processes in soil and freshwater: J. L. Schnoor, discussion leader

C. T. Chiou, "Mechanistic functions of soil organic matter and minerals in the sorption of organic compounds."
B. J. Eadie, "The role of particulate matter and organic carbon in the transport of contaminants in the Great Lakes."

C. T. Driscoll, "Processes regulating the acid-base status of lakes in the Adirondack Region of New York."

Transport processes in surface and groundwater: D. DiToro, discussion leader

D. Imboden, "Integration of physical processes into lake models: How much is known and needed."

P. K. Kitanidis, "Predictive groundwater modeling."

N. H. Brooks, "Hydrologic transport processes: From microns to kilometers."

Atmospheric processes: S. J. Eisenreich, discussion leader

R. A. Rasmussen, "Long-term behavior of atmospheric trace gases."

M. J. Molina, "Chemistry of atmospheric ozone depletion."

T. F. Bidleman, "Semi-volatile organic compounds in the atmosphere."

Biological degradation and accumulation processes: J. Sufflita, discussion leader

J. Tiedje, "Biodegradation of toxic organic compounds."

D. L. Swackhamer, "Bioaccumulation of hydrophobic organics at the primary trophic level."

R. V. Thurston, "Uptake and depuration of xenobiotics by fishes."

Surfactants: A case study: R. A. Hites, discussion leader

R. A. Rapaport, "The fate, transport, and behavior of surfactants in the environment."

W. Giger, "The environmental chemistry of aromatic surfactants and synthetic complexing agents."

Poster sessions: J. R. White, poster session chairman, Indiana University, School of Public and Environmental Affairs, Bloomington, IN 47405.

Enzymes, Coenzymes and Metabolic Pathways

Kimball Union Academy

D. Dunaway-Mariano and C. Thorpe, co-chairpersons

2–6 July

How enzymes work? W. Jencks, discussion leader

I. Rose, "Proton diffusion and conduction processes in enzyme catalysis."

A. Warshel, "Computer simulation of the key role of electrostatic energy in enzyme catalysis."

V. Anderson, "Coenzyme A enzymology: Carbanions and the forgotten coenzyme."

V. Schramm, "Transition state analysis of enzymatic reactions."

Engineering proteins and metabolic pathways: D. Abramowicz, discussion leader

P. Schultz, "Site-directed mutagenesis with unnatural amino acids."

J. Holbrook, "Progress towards the design and synthesis of an all-purpose redox catalyst."

K. Timmis, "Pathway design: Channeling intermediates through desired metabolic routes."

Enzymology of nucleic acids: G. Reed, discussion leader

S. Benkovic, "Mechanism of action of DNA polymerase."

F. Eckstein, "Interaction of restriction endonucleases with phosphorothioate DNA."

P. Schimmel, "Recognition of tRNA studied with enzyme and substrate pieces."

T. Bruice, "Computer-assisted studies of RNA self-processing."

Biosynthesis: C. Townsend, discussion leader

J. Baldwin, "Recent developments in penicillin/cephalosporin biosynthesis."

M. Marletta, "Mammalian biosynthesis of nitric oxide from arginine."

D. Light, "Enzymology of natural rubber biosynthesis."

Enzyme mechanisms: J. Blanchard, discussion leader

J. Gerlt, J. Kozarich, G. Kenyon, "Mandelate racemase: Structure-function relationship."

F. Raushel, to be announced.

G. Babcock, "Redox reactions in photosynthetic oxygen evolution."

R. Matthews, "Synthesis of the methyl group of methionine: Mechanistic studies of the enzymes of the pathway."

Protein structure: B. Rubin, discussion leader

P. Kim, "Peptide modeling of protein folding."

H. Roder, "Structural studies of protein folding."

To be announced, "Chaperonins."

Substrate channeling: K. Johnson, discussion leader

K. Johnson, "Substrate channeling: Fact and fiction."

K. Anderson, "Tryptophan synthase: A model of substrate channeling."

J. Stubbe, "Channeling (?) in the purine biosynthetic pathway."

C. Matthews, "DNA precursor channeling: Enzyme interactions, microcompartmentation, and replication fidelity."

J. Villafranca, discussion leader

G. Petsko, "Structural enzymology in four dimensions."

S. Lippard, "Recognition and processing of platinum anticancer drug-DNA adducts."

Redox enzymes: P. Fitzpatrick, discussion leader

M. Nelson, "Chemistry of the active site iron and the mechanism of lipoxygenase."

S. Sligar, "Mechanisms of oxygenases."

A. Claiborne, "Mechanistic aspects of

flavin-linked oxygen metabolism in streptococci."

Extrachromosomal Elements

Plymouth State College (N)

R. B. Hallick, chairperson; T. Fox, vice chairperson

Mitochondrial and Chloroplast Biogenesis

18–22 June

Organelle genome organization, expression, and evolution: R. Hallick, discussion leader

K. Ohyama, J. Palmer, C. Lemieux

Organelle RNA processing: N. Martin, discussion leader

D. Clayton, L. Simpson

Organelle introns and splicing I: A. Lambowitz, discussion leader

R. Collins, A. Barkan

Organelle introns and splicing II: R. Butow, discussion leader

P. Perlman, A. Gampel

Organelle transformation: J. Boynton, discussion leader

G. Attardi, J. D. Rochaix, S. Williams

Transcriptional and post-transcriptional regulation of organelle genes: J. Mullet, discussion leader

K. Akazawa, W. Gruissem

Nuclear control of organelle gene expression: T. Fox, discussion leader

C. Dieckman, J. McEwin, T. Mason

Organelle protein import and assembly: A. Horwich, discussion leader

G. Lorimer, G. Shore

Mitochondrial gene organization and expression: C. S. Levings, discussion leader

M. Gray, M. Hanson

Foams

Plymouth State College (N)

R. J. G. Dominguez, chairperson; F. E. Bailey, vice chairperson

6–10 August

G. P. Speranza, discussion leader

K. Frisch, K. Ashida, "Recent advances at Polymer Technologies, Inc. (PTI)."

S. G. Entelis, "Functionality type distribution, new important characteristics of oligomers for polyurethane production."

D. T. Wasan, "Foam stability: Ordered microstructures key to thin liquid film behavior."

F. E. Bailey, discussion leader

G. Combs, "New insights into water-blown urethane foam kinetics."

C. W. Macosko, W. D. Artavia, "A model for water-blown foams."

J. Backus, discussion leader

H. W. Frisch, "Diffusion and mechanisms of transport of gases and vapors in polymers."

J. M. Vergnaud, "Modeling of matter transfers through foams."

J. F. Szabat, "Performance of HCFC's in rigid polyurethane foam."

A. Cunningham, discussion leader

G. M. R. de Nazelle, A. J. Dammers, "Efficient computation of transport

phenomena through cellular structures: The relationships between the polymer composition, the foam network morphology, and the foam thermal conductivity aging."

G. J. J. Bart, G. M. R. de Nazelle, "A fundamental understanding of the foam thermal conductivity aging modeling: Comparison of theoretical and measured aging curves."

R. E. Keegan, discussion leader

O. Gaalman, "New melamine foam technology: Chemistry and applications."

Y. Imai, "Polyurethane liquid crystal."

R. P. Tiger, "Mechanism of isocyanate cyclotrimerization and modeling of joint urethane formation and cyclotrimerization process."

J. E. Knight, discussion leader

G. Burkhart, V. Zillmer, "Concepts to soften polyurethane flexible foam."

C. M. Milliren, "Humid aged compression set: Mechanism and solution."

M. Rhodes, discussion leader

P. Delzenne, "Three-dimensional characterization of cellular structure."

M. Bomberg, "Long-term thermal performance evaluation: Understood and not so well-understood issues."

G. Smits, "Fundamental aspects of aging and dimensional stability of CO₂ blown rigid polyurethane foams."

R. J. G. Dominguez, discussion leader

R. D. Priester, J. R. Porter, R. D. Piffley, R. B. Timer, "High resiliency polyurea foam—an improved flexible foam matrix."

R. B. Turner, discussion leader

M. Ilavsky, "Formation structure and mechanical behavior of polyurethane elastomers."

J. W. Leenslag, "Imine based chemistry for high-performance polyurea."

J. Thoen, "The influence of the chain extender structure on the morphology and physical properties of microcellular elastomers."

J. E. Martin, discussion leader
T. Vicsek, "Fractal growth."
M. Matsushita, "Fractal growth and morphological change in the formation of bacterial colonies."
R. Jullien, discussion leader
L. M. Sander, "A phase transition and scaling in ballistic deposition."
J. Krug, "Macroscopic shape and shape fluctuations of growing clusters."
T. Halpin-Healey, "The many dimensional directed polymer in random media."
R. M. Ziff, discussion leader
M. Kosterlitz, "Growth of rough surfaces."
J. Krim, "Characterization of microscopically rough surfaces by means of adsorption isotherms and x-ray scattering."
D. A. Weitz, discussion leader
M. Sahimi, "Random systems."
C. Grebogi, "Fractal structure in the dispersal of particles in fluids."
W. Goldberg, "Light scattering studies of weak turbulence."
P. Meakin, discussion leader
R. F. Voss, General talk.
H. E. Stanley, discussion leader
K. R. Sreenivasan, "Multifractals in turbulence: What we know and what we do not."
B. B. Mandelbrot, "Multifractals."
A. Aharony, "Multifractals."
F. Family will organize a poster session.

Fuel Science

New Hampton School

T. G. Squires, chairperson; F. J. Derbyshire and H. P. Stephens, co-vice chairpersons

2-6 July

New analytical tools for the fuel scientist: G. P. Huffman, discussion leader
A. Sarofim, E. Bar-Ziv, "The use of the electrodynamic balance in carbon oxidation studies."
R. E. Winans, "Analysis of coal derived materials by FAB MS/MS."
T. Aida, "Solvent swelling dynamics as a probe of coal structure."
D. R. Hardesty, "In situ analysis of coal combustion processes."
F. E. Huggins, "Analysis of coal using XAFS spectroscopy."
Chemistry and structure of coal: R. M. Davidson, discussion leader
L. M. Stock, "Organic desulfurization reactions."
C. E. Snape, "Role of functional groups in coal structure."
L. J. Lynch, "Coal as a molecular solid."
G. A. Carlson, "Modeling of coal structure using computer-aided molecular design."
J. W. Larsen, "Non-covalent interactions, conformational rearrangements, and other complexities in coal macromolecular structure."
The chemistry of combustion processes: D. R. Hardesty, discussion leader

C. K. Westbrook, "Combustion of large aliphatic fuel molecules."
P. J. Jessup, "Internal combustion engine fuels: Design and combustion properties."
J. B. Howard, "Formation and destruction of aromatics and soot in flames."
J. A. Miller, "Combustion chemistry of fuel-bound nitrogen."
O. I. Smith, "Chemistry of sulfur species during combustion."
Environmental consequences of fossil fuel utilization: G. B. Wiersma, discussion leader
L. K. Peters, "Atmospheric chemistry, transport, and deposition of energy-related emissions."
J. F. Franklin, "Impacts of fossil fuel emissions on forest ecosystems."
S. Rayner, "Human choice in climate change: Societal impacts and response options."
V. Stagliano, "Long-range plans for rational energy usage."
Presentation of the five best posters: F. J. Derbyshire, H. P. Stephens, discussion leaders
Speakers to be selected by conferences.

Fundamental Interactions of Water with Solid Surfaces

Kimball Union Academy

T. A. Madey, chairperson; P. A. Thiel, vice chairperson

16-20 July

C. Benndorf, discussion leader
P. Norton, "Interaction of water with nickel and aluminum surfaces: Absolute coverages, ordering, and dynamics."
J. M. Heras, "Water on polycrystalline metal surfaces."
G. B. Fisher, discussion leader
H. P. Bonzel, "Alkali-modified adsorption of water."
J. M. White, "Surface science of coadsorbate overlayers involving water."
U. Landman, discussion leader
E. Spohr, "Computer simulations of water on metal surfaces."
J. W. Halley, Jr., "Electronic structure and dynamics at the water/electrode interface."
R. L. Kurtz, discussion leader
V. E. Henrich, "The interaction of water with perfect and defect surfaces of semiconductors and oxides."
S. H. Garofalini, "Water interactions with oxide glass surfaces—molecular dynamics simulations."
P. N. Ross, Jr., discussion leader
E. Stuve, "In situ and ex situ studies of electrochemical phenomena."
F. T. Wagner, "UHV investigations of surface solvation effects in electrochemistry."
P. M. George, discussion leader
Y. Chabal, "Infrared spectroscopy of water—modified silicon surfaces."
J. D. Sinclair, "The role of water in the degradation of electronics: Materials, mechanisms, protection, and challenges."

B. Bunker, discussion leader
B. Lawn, "Surface forces, adhesion, and fracture of brittle solids."
J. D. Porter, "Interfacial structure and dynamics in Hg/H₂O/Hg tunnel junction devices."
M. Robbins, discussion leader
M. Schick, "A theoretical overview of wetting phenomena."
L. H. Dubois, "Wetting of organic surfaces: Microscopic predictions of a macroscopic observable."
J. T. Yates, Jr., discussion leader
C. T. Campbell, "The water-gas shift reaction over clean and Cs-promoted Cu single-crystal catalysts: Elementary processes."
B. Kasemo, "Water formation and decomposition on Pt."

Fungal Metabolism

Proctor Academy

R. L. Metzberg and B. Valent, co-chairpersons

16-20 July

Mutable genomes, transposons and mitochondrial plasmids: E. Selker, chairperson
A. Lambowitz, J. A. Kinsey, V. Miao. Biotransformations: M. Tien, chairperson
D. Cullen, C. A. Reddy, P. Harvey. Plant pathogens: H. D. VanEtten, chairperson
P. J. G. M. de Wit, J. E. Hamer, A. Desjardins. Regulation of enzyme synthesis: C. Yanofsky, chairperson
J. Olefen, R. Geever, C. Yanofsky. Mitosis, meiosis, and cell structure: B. R. Oakley, chairperson
P. W. Robbins, M. D. Rose, S. A. Osmani. Development, mating types, and compatibility: N. L. Glass, chairperson
W. Timberlake, C. Staben, J. Dunlap. Bioengineering of fungi: D. Gwynne, chairperson
M. Ward, M. Devchand, D. Smith. Transport and energetics: C. L. Slayman, chairperson
R. F. Gaber, E. J. Bowman, M. Colombini, R. O. Poyton. Animal pathogens: M. B. Kurtz, chairperson
D. Soll, E. Keath, J. Hicks.

Glass

Tilton School

R. J. Eagan, chairperson; M. J. Weber, vice chairperson

25-29 June

R. J. Eagan, discussion leader
D. Turnbull, "Physics and chemistry of glass formation."
C. J. Brinker, "Structure of sol gel silicate glasses."
J. Batey, "Structural properties of thin film, PECVD SiO₂."
R. K. Brow, discussion leader
K. F. Kelton, "Nucleation and phase separation in glasses."

M. Tomozawa, "Water and defects in glass."
S. Gulati, discussion leader
T. A. Michalske, "The role of strain induced defects in the fracture of silica glass."
J. T. Dickinson, "Fracto-emission from glass surfaces and interfaces."
C. R. Kurkjian, "Strength degradation in high strength fibers."
M. J. Weber, discussion leader
Poster session.
R. Atkins, discussion leader
T. Izumitani, "Defects on the surface of optical glasses."
R. G. Horn, "Surface forces in SiO₂—water interactions."
J. K. West, "Silica cluster models."
J. E. Shelby, Jr., discussion leader
Poster session.
J. Simmons, discussion leader
D. Allan, "Structure and defects in oxides by electronic structure/total energy methods."
F. L. Galeener, "X-ray induction of spin active defects in vitreous silica."
K. Arai, "Nature of defects and doping in silica glasses."
N. J. Kreidl, discussion leader
D. E. Day, "Targeted radiation therapy in humans using glass microspheres."
T. Izumitani, discussion leader
D. L. Griscom, "Physics and chemistry of defects in silica glass and at the Si/SiO₂ interface."
P. Lenahan, "Detection of defects in glass: Electronic measurements."
A. R. Silin, "Point defects: Radiation induced defects in SiO₂."

Effects of Gravity on Biosystems

Colby-Sawyer College (N)

E. K. Ray, chairperson; S. Roux and R. Edgerton, co-vice chairpersons

9-13 July

Fortuitous gravity sensing: G. Albrecht-Beuhler, discussion leader
D. Bray, to be announced
G. Albrecht-Beuhler, "Cellular ultrastructure and possible mechanisms of gravity sensing by cells."
I. Block, "Gravitational response of *Physarum plasmodia*."
E. T. Papoutsakis, "Fluid-mechanical effects on animal cells."
Cell shape and structure: J. Kessler, discussion leader
A. Harris, "Reorganization of extracellular matrix by cellular force in vitro."
A. Ben-Ze'ev, "Modification of cell shape during anchorage-dependent versus suspension growth."
D. E. Ingbar, to be announced.
Transduction of gravity sensing: A. Sievers, discussion leader
E. Schafer, "Light and gravity interaction in tropistic responses of plant cells."
G. Scherer, "Cellular transduction changes induced by auxin in plant cells."

D. Bush, "Hormone-induced changes in cytoplasmic calcium in plant cells." Gravity effects on mechanical forces producing changes in cell structure and function:

H. Vandenburg, "Effect of mechanical stretch on growth of myoblasts."

J. Tidball, "Molecular structure of myotendinous units and their mechanical function."

K. Baldwin, "Contractile proteins in response to mechanical forces."

Spaceflight effects on biosystems: W. Hymer, discussion leader

R. Hammerstedt, "How much is allocated to gravitation-linked events?"

A. Vailis, "Dense fibrous connective tissue responses to microgravity."

J. Papaconstantinou, "Cellular and molecular response to injury and stress."

A. Sievers, "Effects of Micro-G on plant cells as measured in the TEXUS space flight program."

Extracellular phenomena: V. Schneider, discussion leader

R. M. Brown, Jr., "Investigations of cellulose biosynthesis in microgravity."

J. Duke, "Altered aggregation of cartilage matrix molecules in growth plates of flight rats."

Immunology in space and aging: A. Cogoli, discussion leader

I. Kostantinova, "Immunological effects of long-duration space flight observed in Soviet cosmonauts."

G. Sonnenfeld, "Immune response in space flight."

M. Siniscalco, "Effect of aging on chromosome breakage in human lymphocytes."

A. Cogoli, "Effect of space flight on the reactivity of human lymphocytes: In vitro versus ex vivo results."

Neural control of movement: L. Young, discussion leader

I. Koslovskaya, "Long-duration space flight."

G. Paige, "Postural instability with aging and gravitational effects on the vestibular system."

Highlights of each session with general discussion; critical experiments; new ideas and directions; biotechnology, etc.:

Analysis of significance, validity, and usefulness of simulations of microgravity at $1 \times G$, for example, clinostats.

Discussants: A. Brown, A. Parsegian, E. Racker, P. Todd, M. Wilkins.

Hemostasis and Thrombosis

Proctor Academy

H. R. Roberts, chairperson; J. W. Suttie, vice chairperson

11-15 June

G. C. White, II, discussion leader

L. Brass, "New observations on platelet G proteins."

E. Lapetina, "Endogenous ADP-ribosylation in platelets."

T. Evans, "Low molecular weight G proteins in platelets."

D. Lips, "Identification and character-

ization of novel inositol phospholipids and their pathways of metabolism."

R. G. Hiskey, discussion leader

J. Suttie, "Glu site specificity of the bovine γ -glutamyl carboxylase."

B. Furie, "Molecular basis of vitamin K-dependent carboxylation."

C. Walsh, "Mechanistic studies on vitamin K-dependent carboxylase."

R. Rosenberg, discussion leader

D. Stern, "Modulation of endothelial function by hypoxia and host response mediators."

A. Marcus, "Relationships between thrombosis and the inflammation process."

D. Wagner, "von Willebrand factor processing and targeting into storage granules."

R. L. Lundblad, discussion leader

J. Maraganore, "C-terminal synthetic hirudin peptides: Probes of thrombin structure-function."

A. Tulinsky, "Three-dimensional structure of the hirudin: Thrombin complex."

S. Stone, "The molecular mechanism of the interaction of hirudin with thrombin."

K. Kurachi, discussion leader

D. Miller, "Gene therapy of hemophilia."

E. Sadler, "Molecular biology of von Willebrand factor and von Willebrand disease."

J. Morrissey, "Regulation of tissue factor."

D. Stafford, "Chimeric vitamin K-dependent proteins."

New Horizon Session: P. Tracy, discussion leader

Speakers to be selected from submitted abstracts.

D. Phillips, discussion leader

J. Loftus, "Expression and analysis of a ligand binding site in GPIIb-IIIa."

T. Kunicki, "Immunology of platelet integrins: the prototype GPIIb-GPIIa."

K. Burridge, "Integrin-cytoskeletal interactions."

Plenary lecture: R. Lefkowitz, "The adrenergic receptors."

T. Deuel, discussion leader

J. Millerbrandt, "Gene activation: Regulation by growth factors."

T. Deuel, "PDGF mediates diverse activities initiated by thrombosis."

D. Senger, H. Dvorak, "Vascular permeability factor."

Abstracts for consideration of oral and poster presentations in the New Horizons Session should be submitted to the chairperson no later than 30 April 1990. Dr. Harold R. Roberts, Division of Hematology, University of North Carolina, CB#7035, 416 Burnett Womach, Chapel Hill, NC 27599-7035.

Heterocyclic Compounds

New Hampton School

I. Shinkai, chairperson; D. J. Hart, vice chairperson

9-13 July

D. A. Evans, "Studies in asymmetric synthesis."

A. G. Myers, "Synthetic studies of the neocarzinostatin chromophore core. Mechanistic investigations of natural and synthetic biradical precursors."

F. A. Davis, "Asymmetric oxidation using *N*-sulfonyloxaziridines."

J. E. Lynch, "Acetoxyazetidinone, an important intermediate for carbapenem synthesis."

L. N. Jungheim, "Antibody directed catalysis: Cephalosporins as removable protecting groups for antitumor agents."

K. B. Sharpless, "Catalytic asymmetric oxidations in drug synthesis."

D. M. Huryn, "Synthesis of iso-nucleosides: A novel class of anti-HIV agents."

J. Szmuszkowicz, "Recent developments in heterocyclic chemistry."

D. J. Hart, "Studies related to the synthesis of alkaloids and C aryl glycosides."

D. P. Curran, "New methods to control stereochemistry in thermal addition and cycloaddition reactions."

P. A. Jacobi, "Progress toward the enantiospecific synthesis of linear tetrahydropyranes."

P. DeShong, "Manganese pentacarbonyl reagents. New methods for the synthesis of heterocyclic systems."

W. V. Murray, "Synthetic approaches to 1,5-diarylpyrazole anti-inflammatory agents."

M. Newcomb, "Aminium cation radicals for construction of heterocycles."

P. Aristoff, "Synthesis and mechanism of action of CC-1065 analogs."

S. Kobayashi, "Chiral 2-aminomethyl pyrrolidine derivatives as an efficient ligand in asymmetric synthesis."

M. F. Doyle, "Highly selective catalytic methods for carbenoid constructions of lactams and lactones."

J. V. Duncia, "Heterocyclic antihypertensive angiotensin II receptor blockers."

A. S. Kende, "Total synthesis of neooxazolomycin."

R. O. Duthaler, "Thiazolidines derived from L-cysteine, homochiral intermediates for D-amino acids."

C. B. Ziegler, Jr., "Functionalization of the penicillin 6-position via iodine atom transfer chemistry."

Research at High Pressure

Kimball Union Academy

W. J. Nellis, chairperson; W. A. Bassett, vice chairperson

25-29 June

Solid hydrogen: N. W. Ashcroft, discussion leader

H. K. Mao, "Experimental studies of hydrogen at static ultrahigh pressure."

I. F. Silvera, "New high-pressure phases and metallization of hydrogen."

T. W. Barbee, III, "Structural, electronic, and superconducting properties of high-pressure hydrogen."

Invited poster papers: W. A. Bassett, discussion leader

High-temperature superconductivity: M. B. Maple, discussion leader

A. A. Abrikosov, "A model of the

normal-electron energy spectrum of CuO_2 planes in high-temperature superconductors."

R. J. Wijngaarden, "High-temperature superconductors under pressure."

S. T. Weir, "Properties of shock-compacted high-temperature superconductors."

Static pressure: W. B. Holzapfel, discussion leader

S. M. Stishov, "Current issues in static high-pressure research."

P. G. Johansson, "Simple hydrogen-bonded crystals under pressure."

The deep earth: J. M. Brown, discussion leader

E. Knittle, "Deep earth materials: Iron and silicate perovskite at high pressures and temperatures."

R. Boehler, "Iron and perovskite at conditions in the earth."

L. Stixrude, "Melting of MgSiO_3 perovskite: Bounds on the temperature in the deep earth."

Shock synthesis: M. Araki, discussion leader

D. J. Erskine, "Shock synthesis of diamond."

A. B. Sawaoka, "New materials by heterogeneous shock heating."

High temperatures: V. E. Fortov, discussion leader

N. J. Hess, "Sm:YAG—a pressure sensor for high-temperature diamond cell experiments."

N. C. Holmes, "High-temperature and pressure equation of state of ultra-low density materials."

G. Chabrier, "Plasma phase transition in fluid hydrogen: Physical and astro-physical consequences."

Planets and astrophysics: W. J. Nellis, discussion leader

W. B. Hubbard, "Interiors of Uranus and Neptune: Post-Voyager constraints."

Phase transitions: J. W. Shaner, discussion leader

A. L. Ruoff, "Phase transitions and transmutations at multimegabars."

C. E. Morris, "Dynamic phase transformation studies."

J. W. Swegle, "Irreversible phase transitions and wave propagation in silicate geologic material."

High-Temperature Chemistry

Kimball Union Academy

M. A. Frisch, chairperson; C. E. Myers, vice chairperson

23-27 July

Probing the reaction interface: W. Weltner, discussion leader

G. Rosenblatt, "Recent developments in Raman characterization of materials."

G. Richmond, "Nonlinear optics as a probe of buried interfaces."

I. Beattie, discussion leader

J. Wong, "Synchrotron radiation probes for interface structure and high-temperature solid combustion reactions."

M. L. Yu, "Studies of high-temperature surface chemistry in the time domain."

Low-temperature synthesis: E. Cotts, discussion leader

F. DiSalvo, "Synthesis of new transition metal compounds."

D. Johnson, "Diffusion and nucleation in amorphous thin films."

R. Schollhorn, "Metastable materials by electron/ion transfer reactions."

State-of-the-art modeling of high-temperature equilibria: M. Chase, discussion leader

J.-O. Andersson, "Computer modeling using the sublattice concept."

D. Bonnell, "Modeling complex slag phases."

L. Gurvich, "IVANTHERMO: A database for thermochemical modeling."

A. Pelton, "FACT: Thermochemical system for high-temperature equilibria."

M. Rand, "SGTE: Thermodynamic data for the stable and metastable phases of the elements."

K. Spear, "Modeling the oxidation of SiC and Si₃N₄."

New materials generated from the solid interface: F. Wallenberger, discussion leader

G. Tibbetts, "Growth of carbon fibers from vapor phase hydrocarbons at high temperatures."

R. S. Feigelson, "High-temperature growth of single crystal fibers."

A. Navrotsky, discussion leader

F. Holtzberg, "Single crystal growth and characteristics of the high-temperature superconductor YBa₂Cu₃O₇."

M. Cima, "Particulate ceramics processing."

Atoms to solids via the cluster interface: M. Duncan, discussion leader

R. Smalley, "Refractory cluster beams."

M. Mandich, "Hot chemistry on cold silicon."

Geology of the outer solar system from Voyager II probe: H. Wiedemeier, discussion leader

J. Veverka, to be announced.

Reactions at the gas-solid interface: M. Lapp, discussion leader

J.-O. Carlsson, "Gas-solid reactions for selective growth."

D. Baeuerle, "The reaction kinetics in laser chemical processing."

Hormone Action

Kimball Union Academy

C. Bancroft and G. L. Hager, co-chairpersons

6–10 August

Plenary lecture: E. Kandell, "Molecular biological approaches to long-term memory."

Steroid hormone action: E. B. Thompson, discussion leader

B. O'Malley, H. Gronemeyer, D. Granner.

Hormones and development: H. Samuels, discussion leader

M. Rosenfeld, B. Katzenellenbogen, D. Linzer, G. Schutz.

Regulation of secretion: P. Hinkle, discussion leader

R. Kelly, T. Martin, P. Hinkle, S. Wolin, poster session.

Chromatin: G. Hager, discussion leader

T. Richmond, G. Hager, B. Emerson. Signal transduction—transmembrane: J. Rosen, discussion leader

C. R. Kahn, C. Landis, L. Williams. Signal transduction—transcription: C. Bancroft, discussion leader

M. Montminy, J. Dixon, M. Greenberg.

Growth factors and oncogenes: M. Lippman, discussion leader

M. Lippman, J. Massague, poster session.

Special topics: D. Granner, discussion leader

B. Wold.

Yeast peptide mating factors and G proteins: J. Thorner, discussion leader

J. Thorner, M. Whiteway.

Inorganic Chemistry

Brewster Academy

J. S. Bradley, chairperson; R. D. Adams, vice chairperson

30 July–3 August

D. F. Shriver, discussion leader

L. F. Dahl, "Experimental-theoretical studies of small to giant transition metal clusters: Problems and solutions."

B. Teo, "Gold fusion: From clusters to clusters of clusters."

D. M. P. Mingos, "Synthesis, structure, and bonding in metal clusters."

D. F. Shriver, discussion leader

R. Finke, "Polyoxoanions as new materials for atomically dispersed transition metal catalysts: Synthesis, characterization, catalytic activity, and mechanism."

P. Braunstein, "Molecular aspects of the metal-metal bond."

W. Gladfelter, discussion leader

T. P. Fehlner, "Transition metal—main group clusters and solid-state materials."

S. Harris, "Bonding in heterometallic clusters."

B. F. G. Johnson, "Metal clusters, particles, and crystallites."

W. Gladfelter, discussion leader

M. Steigerwald, "Molecular routes to solid-state compounds."

T. Bein, "Synthesis and characterization of clusters and organometallics in zeolites."

J. S. Bradley, discussion leader

A. Simon, "Electronic delocalization and spin properties in lanthanide compounds with discrete and condensed clusters."

J. K. Burdett, "Some new theoretical ideas linking molecules, surfaces, and solids."

I. I. Moiseev, "Synthesis, structure, and catalytic activity of giant palladium clusters."

J. S. Bradley, discussion leader

L. Lewis, "Preparation and characterization of platinum group metal colloids: Crossroads between clusters and surfaces."

G. Schmid, "Large transition metal clusters and colloids—bridges between homogeneous and heteroge-

neous catalysis."

R. J. Madix, discussion leader

R. Nuzzo, "Structure-reactivity correlations in surface organometallic chemistry."

C. M. Friend, "Mechanistic and structural surface chemistry."

L. Bonneviot, "Preparation, structure, and stability of transition metal ion deposits on amorphous silica."

R. Madix, discussion leader

T. E. Mallouk, "Light-driven electron transfer reactions in microporous solids."

S. Chiang, "Scanning tunneling microscopy of adsorbed molecules on surfaces."

R. D. Adams, discussion leader

R. N. Perutz, "Plotting the course of C-H activation reactions-reactive intermediates in organometallic chemistry."

J. R. Shapley, "Reactive intermediates in cluster chemistry."

M. Poliakoff, "Detecting reactive intermediates in inorganic chemistry."

Chemistry at Interfaces

Colby-Sawyer College (N)

B. L. Haendler, chairperson; M. L. Hair, vice chairperson

2–6 July

R. Strey, discussion leader

D. F. Evans, "STM/AFM imaging of organic molecules at interfaces."

Y. Talmon, "Direct imaging by cryo-transmission electron microscopy."

R. Strey, discussion leader

W. Benton, "Direct visualization of interfacial phenomena."

J. Zasadzinski, "High-resolution imaging of microstructured fluids."

J. Mann, Jr., discussion leader

R. Tredgold, "Langmuir-Blodgett films from preformed polymers—some recent developments."

H. Ringsdorf, "Interactions of proteins and interfaces—specific recognition, 2-D crystallization, and enzyme function at lipid monolayers."

P. Stroeve, "FTIR studies on Langmuir-Blodgett films."

N. Pallas, discussion leader

J. Rabolt, "Interdiffusion of cadmium arachidate molecules across a polymer interface in L-B films."

E. Franses, "Composition and permeability of Langmuir-Blodgett films."

E. Kaler, discussion leader

F. Candau, "Polymerization of various organized microstructures."

D. Meier, "Interfacial activity in polystyrene-polyethylene blends."

M. Hair, discussion leader

A. Gast, "Block copolymeric micelles."

P. Green, "Interfacial segregation of diblock copolymers."

M. Green, discussion leader

F. Brochard, "Wetting and dewetting by polymer liquids."

L. Turkevich, discussion leader

P.-G. de Gennes, "Weak junctions and polymer adhesion."

L. Abrams, discussion leader

K. Vanderlick, "Phase and associated shape transitions of phospholipid monolayer domains."

G. Smith, "X-ray and neutron scattering studies of multilamellar lipid preparations."

Intermediate Filaments

Holderness School

P. M. Steinert, chairperson; R. K. H. Liem, vice chairperson

2–6 July

Intermediate filament expression during development: T.-T. Sun, discussion leader

R. Oshima, "Expression of keratins 8 and 18 during murine development."

T. Sargent, "Expression of intermediate filaments during *Xenopus* embryogenesis."

E. Fuchs, "Regulation of keratin expression by retinoids during epithelial development."

Interaction of intermediate filaments with the cell and nuclear surfaces: J. Jones, discussion leader

K. Green, "Structure of desmoplakin: Possible mode of interaction with intermediate filaments."

S. Georgatos, "Functional bipolarity of vimentin and desmin intermediate filaments."

Structure of intermediate filaments: U. Aebi, discussion leader

D. Parry, "Theoretical structural models of intermediate filaments."

N. Hirokawa, "Structure of neurofilaments elucidated by electron microscopy."

A. Steven, "Structural organization of intermediate filaments by use of STEM."

Intermediate filament associated proteins: P. Steinert, discussion leader

B. Dale, "Interaction of filaggrin with keratin intermediate filaments."

G. Wiche, "Plectin structure, expression, and organization."

Gene expression and regulation of the intracellular organization of intermediate filaments: G. Rogers, discussion leader

F. McKeon, "Site-directed mutagenesis alters nuclear distribution of lamins."

R. Liem, "Stable expression of neurofilament genes in transfected cell lines."

Z. Zehner, "Regulation of vimentin gene regulation."

How does phosphorylation regulate the organization of intermediate filaments?

B. Eckert, discussion leader

Y. Chou, "Role of phosphorylation on the reversible assembly/disassembly of vimentin and nuclear lamins."

V. Lee, "Effects of phosphorylation on the organization of neurofilament chains."

Use of transgenic models to probe the expression of intermediate filaments: L. Parysek, discussion leader

D. Roop, "Expression of the human keratin 1 gene."

J.-P. Julien, "Expression of human neurofilament genes."

G. Rogers, "Expression of hair follicle

genes."

The cellular and molecular biology of intermediate filaments: Poster discussions: M. Blumenberg, M. Klymkowsky, discussion leaders

New approaches to the study of intermediate filament functions: I. Freedberg, discussion leader

R. Goldman, "Cell biological approaches."

H. Bloemendal, "Molecular biology approaches."

W. Franke, "What is the function of keratin intermediate filaments?"

Ion Channels

Colby-Sawyer College (S)

H. A. Lester, chairperson; J. Nerbonne, vice chairperson

6-10 August

C. Miller, discussion leader

E. Hawrot, "The 3-D structure of a ligand binding site."

J. Richardson, "Ion channel proteins as 3-D structures."

S. Heinemann, discussion leader

R. C. Hardie, "Histamine-gated chloride channels: A novel 'fast' synaptic receptor."

K. Imoto, "Structure-function studies of the acetylcholine receptor channel by site-directed mutagenesis."

J. H. Steinbach, "Current-voltage relationships for nicotinic receptors."

C. Stevens, "Neuromodulation of glutamate receptor channel properties by phosphorylation."

W. Agnew, "Voltage-sensitive sodium channels: Variations in structure, function, and regulation."

R. Dunn, "Further mutational analysis of the rat brain sodium channels."

C. Armstrong, "Divalent cations and voltage-dependent gating."

R. Aldrich, discussion leader

R. Joho, "Brain potassium channels: Genetic and biological diversity."

S. Nakanishi, "Structure and function of a possible epithelial potassium channel."

M. Tanouye, "Potassium channel structure and function."

K. L. Magleby, discussion leader

G. Augustine, "Clustering of calcium channels in nerve terminals."

E. Neher, "Calcium regulation in mast cells."

R. Zucker, "Roles of calcium and potential in transmitter release assessed with caged calcium compounds."

B. Hille, discussion leader

K. Campbell, "Properties of ryanodine and dihydropyridine receptors."

J. Hume, "C1 channels in heart."

B. Kaupp, "Structure and function of cGMP-gated channels."

Q. Al-Awqati, discussion leader

D. Eaton, "Regulation and expression of amiloride-sensitive Na channels."

L. Reuss, "Regulation of ion channels in epithelial cells."

M. Welsh, "Chloride transport by CF epithelia."

P. Adams, "From single channel to

cell behavior."

D. DiFrancesco, "The hyperpolarization-activated current, i_f : Properties and modulation by neurotransmitters."

J. Nerbonne, "Burst-firing in mammalian cortical neurons."

Lasers in Medicine and Biology

Kimball Union Academy

J. E. Boggan, chairperson; C. Puliafito, vice chairperson

9-13 July

Effects of tissue on light: B. Wilson, discussion leader

S. Svanberg, "In vivo fluorescence."

W. Star, "In vivo optical dosimetry."

R. Steiner, "Laser Doppler."

Effects of light on tissue: R. Birngruber, discussion leader

L. Svaasand, "Photothermal effects."

I. Kochevar, "Nonlinear photochemical effects."

R. Birngruber, "Photoacoustic/mechanical effects."

J. Boggan, discussion leader

S. Jacques, "Tissue optics."

M. Feld, "Laser-based spectral diagnosis."

Optical trapping: M. Berns, discussion leader

A. Ashkin, "Optical trapping: Principles and history."

W. Wright, "Models and biological systems."

S. Block, "Biomechanics of intracellular activity."

T. Buican, "Cell sorting by optical trapping."

Time-resolved spectroscopy: S. Jacques, discussion leader

B. Chance, J. Lakowitz, M. Patterson. Photochemistry, S. Bown, discussion leader

J. Van Lier, "Photosensitizers in medicine."

D. Phillips, "Potential photophysical and photochemical reactions in medical therapy."

B. Henderson, "What are we to achieve with PDT?"

Tissue ablation: Mechanism and clinical strategies: C. Puliafito, discussion leader

R. Srinivasan, "High-speed imaging of UV laser ablation of tissue."

J. Walsh, "Infrared laser tissue ablation."

L. Deckelbaum, "Control of laser ablation."

Biomodulation with lasers: J. Basford, discussion leader

A. Meister, D. Harris

J. Boggan, discussion leader

A. Grinvald, "Optical mapping of brain."

V. S. Letokhov, "Photo-ion microscopy."

Lipid Metabolism

Kimball Union Academy

A. Jonas, chairperson; C. Kent,

vice chairperson

18-22 June

Structure of apolipoproteins: A. M. Gotto, Jr., discussion leader

A. M. Gotto, Jr., "Structure of ApoB and its possible relevance to atherogenicity."

M. Rosseneu, "Computer modeling of apolipoprotein-lipid complexes."

Y. L. Marcel, "Immunological studies on the structure of Apo A-I."

Lipid-protein interactions at interfaces: M. C. Phillips, discussion leader

J. Seelig, "Molecular recognition of peptides at membrane surfaces."

J. P. Segrest, "The amphipathic helix motif: Classes and properties."

Structural modifications of LDL that affect its metabolism: D. Steinberg, discussion leader

D. Steinberg, "Modifications of LDL structure that increase its atherogenicity."

D. M. Lee, "Thiolester linkages of ApoB and their effects on cell interactions."

S. G. Young, "Mutations altering ApoB structure that also affect its metabolism."

Lipoprotein (a): A. M. Scanu, discussion leader

K. A. Hajjar, "Thrombogenicity of Lp(a)."

M. Haberland, "Macrophage recognition of malondialdehyde-modified LDL-receptor dysfunctional lipoproteins."

Role of HDL in the removal of cholesterol from cells: C. J. Fielding, discussion leader

W. J. Johnson, "Efflux of cholesterol from cells."

L. K. Curtiss, "Use of monoclonal antibodies in probing HDL function."

M. Lefevre, "Interstitial fluid HDL metabolism."

Lipid-transfer proteins: A. R. Tall, discussion leader

K. W. A. Wirtz, "Mechanisms of lipid-transfer proteins."

J. R. Wetterau, "Microsomal triglyceride transfer protein and its relationship with protein disulfide isomerase."

Regulation of gene expression: J. Scott, discussion leader

T. Leff, "Apolipoprotein gene expression."

K. G. Xanthopoulos, "Cell-specific transcriptional control."

J. Metherall, "Regulatory studies in sterol-resistant mutants."

Lipoprotein receptor function: R. J. Deckelbaum, discussion leader

R. J. Deckelbaum, "Interactions of LDL with LDL receptors."

J. Herz, "Cellular uptake of ApoE-enriched lipoproteins by LRP."

Lipoprotein biosynthesis and secretion: D. Vance, discussion leader

D. Vance, "Role of phospholipid biosynthesis in lipoprotein secretion."

R. Davis, "ApoB is both integrated into and translocated across the ER."

T. M. Forte, "Nascent lipoprotein secretion by several human hepatoma lines: Constancy in diversity."

Liquid Crystalline Polymers

Colby-Sawyer College (S)

G. Calundann, chairperson; J. Blackwell, vice chairperson

2-6 July

L. Chapoy, discussion leader

R. M. Vasta, "Synthesis and characterization of thermotropic liquid crystalline copolyesters."

H. Pielartzik, "Thermotropic liquid crystalline polyesters and polyester carbonates."

E. Chiellini, "Structural and stereochemical isomerism effects in thermotropic liquid crystalline polymers."

W. Heitz, discussion leader

H. R. Kricheldorf, "Synthesis and characterization of thermotropic poly(esterimide)s."

V. Percec, "Liquid crystal polyethers based on conformational isomerism."

A. H. Windle, discussion leader

I. M. Ward, "Structure and properties of oriented thermotropic liquid crystalline polymers."

M. Ballauff, "Stiff-chain polymers: Conformation, mesophase formation, and flow behavior."

E. L. Thomas, "Disinclination interactions in the presence of an orienting field."

E. T. Samulski, discussion leader

J. Economy, "The microstructure of liquid crystalline aromatic polyesters."

H. Finkelman, "Order and phase transformation in liquid crystalline elastomers."

K. F. Wissbrun, discussion leader

J. Mewis, "A comparison of rheological and rheo-optical transient behavior in lyotropic LCP's."

H. H. Winter, "Rheology of thermotropic liquid crystalline polymers."

M. Laun, "Rheological investigations on thermotropic polyesters."

M. M. Denn, discussion leader

S. van der Zwaag, "Orientation development in aramid fibers."

R. A. Weiss, "Molecular conformation of a nematic liquid crystalline polymer."

R. S. Porter, discussion leader

M. Doi, "Phase transition of liquid crystalline polymers in a flow field."

D. Y. Yoon, "Chain conformations and packing nematic and smectic-type phases of bulk polymers."

F. Hardouin, "The properties of the nematic phases of side-chain polysiloxanes."

R. W. Lenz, discussion leader

H. Ringsdorf, "Liquid crystalline polymers in material science and life science: Induced discotic phases and 2D crystallization of proteins on functional monolayers."

J. Blackwell, discussion leader

G. Farrow, "Processing, properties and applications of fibers from thermotropic liquid crystalline copolyesters."

G. S. Attard, "Structure-property considerations in the design of liquid crystalline side-chain polymers for optoelectronic applications."

J. H. Wendorff, "Design of liquid crystalline polymers with special proper-

ties: Theory and experiment."

Lysosomes

Plymouth State College (S)

P. Stahl, chairperson; A. Hubbard, vice chairperson

25-29 June

W. Balch, "Reconstitution of ER to Golgi transport."

D. Vaux, "Putative KDEL binding proteins."

A. Townsend, "Class I-mediated antigen presentation."

R. Klausner, "Dynamic interactions between ER and Golgi."

R. Simoni, "Lipid traffic among intracellular organelles."

J. Rothman, "Reconstitution of vesicular transport in Golgi."

S. Kornfeld, "Mannose phosphate receptor structure/function."

K. Von Figura, "The alternate pathway/lysosome biogenesis."

S. Emr, "Mutants affecting vesicular traffic."

R. Anderson, "Endocytosis via smooth vesicles."

J. Kaplan, "Endosome biogenesis."

P. Stahl, "Reconstitution of endosome fusion."

A. Hubbard, "Origins of cell polarity."

K. Mostov, "Molecular biology of transporters."

D. James M. Mueckler, "The glucose transporter."

P. Allen, "Processing and presentation of self proteins."

P. Cresswell, "Invariant chain processing."

F. Brodsky, "Immunolocalization studies of antigen processing."

A. Schwartz, "Ubiquitin-dependent proteolysis."

J. F. Dice, "Lysosomal proteolysis of cytosolic proteins."

W. Dunn, "Autophagy."

S. Silverstein, The First Alex Novikoff Lecture.

K. Sandhoff, "Co-factors for lysosomal hydrolysis."

E. Birkenmeier, "Gene transfer and storage disease."

Magnetic Resonance in Biology and Medicine

Tilton School

R. G. Bryant, chairperson; B. J. Gaffney, vice chairperson

16-20 July

Magnetic microscopy: G. Drobney, chairperson

P. Lauterbur, "Microscopy by 3D projection reconstruction: Problems, solutions, more problems."

L. Jelinski, "Stroboscopic micro MRI: Arterial stiffness and blood flow."

A. Johnson, "MR microscopy/histology."

Spatial localization: B. Gaffney, chairperson

T. Brown, "Chemical shift imaging."

J. Freed, "Orientation selectivity by modern time domain and high-frequency ESR methods."

Quantitation: G. Glover, chairperson

R. P. Mason, "Quantitation of free radical formation through spin trapping."

B. Balaban, "Use of natural line shapes in the analysis of NMR spectra."

M. Henkelman, "Quantitation and relaxation."

Flow and perfusion: J. Ackerman, chairperson

B. R. Rosen, "Real time perfusion imaging."

I. R. Young, "Perfusion and flow."

D. LeBihan, "Molecular diffusion and microcirculation in brain."

Relaxation: M. Tweedle, chairperson

J. Gore, "Proton relaxation in tissues."

J. Kowalewski, "Electron and nuclear relaxation."

R. Lauffer, "Relaxivity enhancement of protein bound chelates."

Quadrupole problems: T. Dixon, chairperson

C. Springer, "The physical state of intracellular sodium."

J. Ingwall, "Sodium-23 NMR of biological systems: Applications to striated muscle."

T. Schleich, "Quadrupole ion relaxation in crowded protein environments."

New twists: M. Klein, chairperson

B. Griffin, "Solid-state NMR distance measurements and high field dynamic nuclear polarization in proteins."

H. Thomann, "Pulsed electron-nuclear resonance in metalloproteins."

M. Klein, "Metabolic uses of tritium NMR spectroscopy."

Spatial localization: K. Ugurbil, chairperson

R. Hurd, "Gradient selection of coherence transfer: High resolution and in vivo applications."

J. S. Hyde, "Advances in MRI spatial resolution in humans."

Spectroscopy: J. Glickson, chairperson

L. Sillerud, "Carbon spectroscopy of tumors."

H. Halpern, "EPR imaging oximetry in tissues."

J. Saunders, "Proton spectroscopy of tumors."

Mammalian Gametogenesis and Embryogenesis

Colby-Sawyer College (N)

J. Rossant, chairperson; R. Schultz, vice chairperson

30 July-3 August

Genetics of spermatogenesis: N. Hecht, discussion leader

D. Wolgemuth, "Proto-oncogenes and sperm function."

B. Simpson, "Testis-determination and the role of *Zfy* genes."

R. Palmiter, "Transcription factors interacting with the protamine-1 promoter."

Molecular control of oogenesis and cell cycle: R. Schultz, discussion leader

J. Ruderman, "Cyclins and cell cycle control."

R. Bachvarova, "Stage-specific gene expression in oogenesis."

Regulation of early embryonic development: L. Wiley, discussion leader

M. DePamphilis, "Enhancer function in oocytes and early embryos."

M. Johnson, "Cell-cell interactions at compaction."

J. Kidder, "Regulation of gap-junction gene expression in the preimplantation embryo."

Regulation of sperm function: I. Fritz, discussion leader

M. Griswold, "Protein secretion in the synchronized testis."

B. Shur, "The role of galactosyl transferase function in sperm."

E. M. Eddy, "Testis-specific gene expression."

Lineage analysis in the postimplantation embryo: K. Lawson, discussion leader

C. Stern, "Mesoderm formation and segmentation in the chick."

R. Beddington, "Somite cell lineage analysis in mammals using transgenic markers."

M. Bronner-Fraser, "Neural crest cell lineage."

Developmental mutants—old genes and new: S. Waelsch, discussion leader

R. Balling, "The role of *Pax-7*/undulated gene product in development."

F. Costantini, "Identification of lethal mutants by insertional mutagenesis."

T. Magnuson, "Molecular characterization of *albino* deletion mutants affecting embryonic development."

Targeted mutagenesis in development: J. Rossant, discussion leader

A. Joyner, "Engrailed-like genes: Functions in the nervous system and somites."

O. Smithies, "Targeted mutagenesis in mouse and hamster ES cells."

Cell-cell interactions in gametogenesis: J. Eppig, discussion leader

D. Djakiew, "Sperm-Sertoli interactions."

A. Salustri, "Oocyte-cumulus cell interactions."

P. Burgoyne, "Cumulus cells versus Sertoli cell—of the Y chromosome."

Growth factors and inductive processes: B. Hogan, discussion leader

J. Smith, "Growth factors and mesoderm induction in *Xenopus*."

M. Mercola, "PDGF and PDGF-F receptors: Functions in early development."

A. McMahon, "Int proto-oncogenes and inductive processes."

Medicinal Chemistry

Colby-Sawyer College (N)

C. Harbert, chairperson; P. Anderson, vice chairperson

6-10 August

Blood coagulation cascade: J. Shafer, session chair

J. Hawiger, R. Gould, S. Olson, J. Maraganore.

Immunomodulators: A. Williamson,

R. Sindelar, session chairs

A. Williamson, D. Rich, L. Adorini, S. Schreiber.

Small molecule/protein interactions: T. Perun, session chair

D. Matthews, S. Fesik, P. Bartlett.

Cholecystokinin—agonists and antagonists: M. Williams, session chair

A. Nadzan, J. Rosamond, J. Martinez, B. Evans.

Neuronal Ca^{++} channels: D. Triggle, session chair

D. Triggle, B. Bean, A. Scriabine, G. Johnson.

Antiarrhythmic agents: W. Lumma, session chair

R. Stein, T. Argentieri, G. Phillips, B. Singh.

Antiviral agents: M. Mansuri, session chair

J. Martin, D. Kempf, J. Rossi, D. DiMaio.

Special session: C. Harbert, session chair

Speaker and subject to be announced.

Special topics in medicinal chemistry: P. Anderson, session chair

Speakers and subjects to be announced.

Persons wishing to present posters during the two sessions should contact Dr. Paul S. Anderson, Merck, Sharp & Dohme Research Laboratories, West Point, PA 19486.

Methanogenesis

Plymouth State College (S)

R. Gunsalus and G. Fuchs, co-chairpersons

2-6 July

Enzyme processes I: G. Ferry, discussion leader

R. Wolfe, "Activation and reduction of carbon dioxide in methanogenesis."

R. Thauer, "Enzymes in the initial and final steps of methanogenesis for CO_2 reduction to CH_4 ."

S. Albracht, " F_{430} nonreducing hydrogenase from *Methanobacterium thermoautotrophicum*."

D. Grahame, "Methyltransferases of *Methanosarcina barkeri*."

Enzymes processes II: R. S. Wolfe, discussion leader

G. Ferry, "Acetate utilization pathways in the *Methanosarcina*."

S. Zinder, "Conversion of acetate to methane by a thermophilic *Methanotheroxys* sp."

S. Ragsdale, "Acetyl-CoA synthesis in acetogenic bacteria."

Metabolism: G. Fuchs, discussion leader

H. Konig, "Biosynthesis of methanogen cell envelopes."

W. Whitman, "Autotrophic CO_2 assimilation in *M. maripaludis*."

M. Roberts, "New osmoregulatory compounds in the methanogenic archaeobacteria."

Bioenergetics: R. D. Simoni, discussion leader

G. Gottschalk, "Electron transport reactions related to ATP synthesis in

methanogenic bacteria."

P. Schonheit, "The sodium cycle in methanogenesis: Sodium-motive-force-driven CO₂ reduction to the formaldehyde level."

G. Schafer, "ATPases and electron transport-driven proton pumps of thermoacidophilic archaeobacteria."

J. Konisky, "Function of a novel *Methanococcus voltae* P-type ATPase."

Molecular genetics: R. Gunsalus, discussion leader

M. Thomm, "Cell-free expression of tRNA and protein encoding genes from *Methanococcus* mediated by archaeobacterial transcription factors."

K. Sandman, "DNA binding proteins from *Methanothermobacter* ferredoxin."

P. Palm, "The large genes of DNA-dependent RNA polymerase of *Methanococcus vannielii*."

J. Reeve, "The structure of cloned methanogen genes."

Genetics: D. Nagle, discussion leader

T. Leisinger, "Characterization of selectable *Methanobacterium thermoautotrophicum* genes."

A. Klein, "Development of vectors for use in *Methanococcus voltae*."

L. Meile, "Properties and use of bacteriophage IML as a gene transfer agent in *Methanobacterium thermoautotrophicum*."

J. Bertani, "Transduction-like gene transfer in *Methanococcus voltae*."

Enzymes structure and cofactors: R. Thauer, discussion leader

M. Summers, "Factor F430: Structure determination by NMR and distance geometry computational methods."

R. White, "Biosynthesis of methanopterin and component B."

J. Keltjens, "Enzymes involving tetrahydromethanopterin compounds."

T. C. Stadtman, "Selenium enzymes and seleno-tRNAs in *Methanococcus vannielii*."

Related systems: J. Konisky, discussion leader

W. Zillig, "Transcription in archaeobacteria testifies for the early evolution of organisms."

C. Daniels, "RNA processing in the archaeobacteria."

K. Stetter, "A novel archaeobacterial biotope."

Summary and perspectives.

Microbial Toxins and Pathogenesis

Plymouth State College (N)

J. Mekalanos, chairperson; S. Nor-mark, vice chairperson

16-20 July

Toxins: Activation by bacterial and host factors: J. Moss, discussion leader

J. Moss, "ARF factor and activation of cholera toxin and LT."

A. Weiss, "The adenylate cyclase toxin of *Bordetella pertussis*."

S. Leppla, "Edema and lethal toxins of bacillus anthrax."

Fimbrial and non-fimbrial bacterial adhesins: S. Lory, discussion leader

S. Lory, "The pill of *Pseudomonas aeruginosa*."

D. Paruchuri, "The glycolipid adhesin of the gonococcus."

S. Hultgren, "Biogenesis of PAP pill of *Escherichia coli*."

Bacterial invasion: R. Isberg, discussion leader

R. Isberg, "Interaction of invasion with host receptor."

V. Miller, "Invasion mechanisms of *Yersinia* and *Salmonella*."

D. Portnoy, "Invasion and intracellular survival of *Listeria*."

Intracellular survival: M. Selsted, discussion leader

M. Selsted, "Biochemical analysis of microbial defensins."

W. Kay, "The S-layer of *Aeromonas salmonicida*."

H. Shuman, "Genetics analysis of *Legionella* invasion and survival."

Structure and function of virulence regulatory proteins: J. Miller, discussion leader

J. Miller, "The Vir regulatory locus of *Bordetella pertussis*."

V. DiRita, "Signal transduction by ToxR and ToxS in *Vibrio cholerae*."

R. Novick, "The Agr regulatory locus of *Staphylococcus aureus*."

Temperature in the control of virulence gene expression: G. Cornelius, discussion leader

G. Cornelius, "VirF and the control of virulence in *Yersinia*."

A. Maurelli, "Control of *Shigella* invasion by VirR."

D. Low, "Thermal regulation in the control of PAP expression."

Biotechnological applications of toxins: J. Murphy, discussion leader

J. Murphy, "Pharmacological properties of IL2-DT fusion proteins."

I. Pastan, "Cytotoxicity for HIV-infected cells of CD4-exotoxin A."

S. Carroll, "Immunotoxins."

Molecular strategies for vaccine development: C. Loche, discussion leader

C. Loche, "Genetic engineering of *Pertussis* toxoids."

S. Miller, "New attempted *Salmonella* live vaccines."

M. Neutra, "Experimental model for assessing mucosal immunity."

Special lecture:

H. Smith, "The host environment as an effector of bacterial virulence properties."

Chemistry and Physics of Microstructure Fabrication

Colby-Sawyer College (S)

H. G. Craighead, chairperson; J. Meingailis, vice chairperson

9-13 July

H. Craighead, discussion leader

D. Tennant, "Projection x-ray lithography."

M. McCord, "STM electron optics and lithography."

J. Meingailis, discussion leader

R. Kubena, "Ion beam lithography."

A. Wagner, "Ion-induced deposition."

H. Tempkin, "In situ growth and pat-

terning."

E. Hu, "Advances in ion etching."

H. Gray, "Vacuum microelectronics."

N. MacDonald, "Microfabricated mechanical devices."

K. Wise, "Microfabricated sensors."

E. Wolf, "Biostatic gene therapy, plant smart fungi, and other topics in microbiology where fabricated microstructures are needed."

P. Petroff, "Microstructure growth on tilted superlattices."

J. Harbison, "Growth of nanostructures on patterned substrates."

R. Buhrman, discussion leader

W. Brunger, "Electron beam-induced metal deposition."

Modeling in Solar Terrestrial Physics

Plymouth State College (S)

M. L. Goldstein, chairperson; C. Goertz, vice chairperson

30 July-3 August

M. Hudson, T. Hill, G. Chanteur, discussion leaders

R. Walker, "Simulating the configuration and dynamics of the Earth's magnetosphere."

J. Fedder, "Solar wind-magnetosphere interactions as seen from global simulations."

R. Wolf, "Plasma sheet confusion."

C. Goertz, M. Scholer, discussion leaders

J. Lyon, "Global MHD simulations—How good are they?"

M. Ashour-Abdalla, "The structure and dynamics of the dayside magnetopause."

T. Gombosi, S. Suess, S. Brecht, discussion leaders

R. Roble, "Modeling physical and chemical processes in the thermosphere and ionosphere using the NCAR thermosphere/ionosphere general circulation model (TIGCM)."

R. Schunk, "Recent advances in modeling the coupled ionosphere-polar wind system."

P. Palmadesso, "Generalized fluid models as vehicles for the study of multiscale space plasma phenomena."

A. Klimas, discussion leader

J. Finn, "Kinetic approach to three-dimensional magnetic reconnection."

D. Rees, "The response of the coupled ionosphere-thermosphere system to magnetospheric forcing: Case studies."

S. P. Gary, B. Bavassano, discussion leaders

D. Papadopoulos, "Forecasting in the solar terrestrial environment using nonlinear dynamics analysis of time series of data."

W. Matthaeus, "Homogeneous MHD turbulence theory and large-scale modeling."

R. Rosner, "What we know and don't know about convection."

D. Baker, T. Forbes, discussion leaders

E. Ott, "Chaotic flows and fast magnetic dynamos."

N. Brummell, "Compressible three-

dimensional turbulent convection in the outer layers of the sun and stars."

D. Montgomery, discussion leader

E. Priest, "Modeling solar prominences."

K. Hamilton, "Comprehensive meteorological modeling of the troposphere, stratosphere, mesosphere, and lower thermosphere."

D. Randall, "The effects of clouds on climate: Results from global models."

G. Siscoe, S. Sofia, discussion leaders

C. Mechoso, "Modeling atmospheric phenomena of differing length scales."

M. Schlesinger, "Global warming: Fact or fiction?"

R. Bruno, A. Barnes, T. Tajima, discussion leaders

V. Pizzo, "Modeling large-scale solar wind flows from a tilted dipole corona."

R. Steinolfson, "Simulations of coronal mass ejections."

D. A. Roberts, "Modeling solar wind turbulence."

Modeling of Flow in Permeable Media

Plymouth State College (S)

J. C. Parker, chairperson; L. Orr, M. King, and J. Wilson, vice chairpersons

13-17 August

The following will speak: K. Aziz, B. Bachman, M. Celia, H. van Duijn, R. E. Ewing, F. J. Fayers, S. Gorell, G. R. Jerauld, P. R. King, P. Kitanidis, D. L. Koch, D. McLaughlin, D. Pollard, G. Pope, M. Quintard, K. S. Sorbie, F. I. Stalkup, E. Sudicky, M. F. Wheeler, A. D. Woodbury.

Molecular and Ionic Clusters

Volterra, Italy

A. W. Castletman, Jr., chairperson; I. V. Hertel, vice chairperson

3-7 September

UV spectroscopy of large clusters: E. R. Bernstein, discussion leader

D. H. Levy, "Structure of clusters around large molecules."

E. W. Schlag, "Spectroscopic shifts at high resolution."

U. Even, "Spectral effects due to phase transitions."

Studies of large clusters in the IR: D. J. Nesbitt, discussion leader

R. E. Miller, "Spectroscopy of large inorganic clusters."

G. E. Ewing, "Infrared spectroscopy of clusters: Theory and experiment."

G. Scoles, "Single molecule solvation in large clusters by IR spectroscopy."

Rare gas clusters—excitation processes: M. R. Topp, discussion leader

J. Jortner, "Excitation and energy transfer in rare gas systems."

Rare gas clusters—structure and phases: T. Kondow, discussion leader

R. S. Berry, "Phase transitions in clusters."

J. Michl, "Rare gas cluster ions generated from the condensed phase."
 Electron solvation: M. A. Johnson, discussion leader
 U. Landman, "Charge migration in clusters."
 R. L. Whetten, "Electron solvation in alkali halide systems."
 K. H. Bowen, "Electron solvation in large hydrogen-bonded cluster systems."
 Photoinitiated processes in clusters: A. W. Castleman, Jr., discussion leader
 H. Baumgartel, "Photoinitiated reactions in organic clusters."
 A. J. Stace, "Reactions in clusters of mixed composition."
 R. J. Stanley, "Solvation effects on spectroscopy and dynamics."
 Spectroscopy of cluster ions: R. Naaman, discussion leader
 M. T. Bowers, "Dissociation and UV/VIS spectroscopy of cluster ions."
 M. W. Crofton, "Infrared spectroscopy of cluster ions."
 J. M. Lisy, "Spectroscopy through dissociation."
 Ionization and metastable processes: N. Nishi, discussion leader
 I. V. Hertel, "Ionization potentials, excitons and fragmentation."
 Magic numbers and dissociation dynamics: O. Echt, discussion leader
 M. A. El-Sayed, "Relationship of magic numbers and dissociation dynamics."
 T. D. Mark, "Magic numbers in large rare gas clusters and multiply charged systems."
 Clusters: Relationship to related fields: A. Kaldor, discussion leader
 D. R. Herschbach, "Understanding reactivity effects due to solvation."
 B. J. Berne, "Reaction dynamics of condensed phases."
 Cluster ion reactions—ion cluster thermochemistry/structure: C. Lifshitz, discussion leader
 D. G. Truhlar, "Solvation and tunneling effects in reactions."
 M. J. Henchman, "Solvation effects on ion reactions."
 T. P. Martin, "Studies of cluster ion structures."
 Abstracts of work to be considered for posters should be sent to Dr. A. W. Castleman, Jr., Department of Chemistry, Pennsylvania State University, University Park, PA 16802.

Diffraction Methods in Molecular Biology

Colby-Sawyer College (S)

B. W. Matthews, chairperson; S.-H. Kim, vice chairperson

11–15 June

Protein crystallization, microgravity, and robotics:
 L. DeLucas, P. Webber, N. Jones.
 Synchrotron facilities and data collection techniques:
 K. Moffatt, J. Smith, K. Watenpaugh.
 Structure determination by molecular replacement and by multiple wavelength methods:

A. Brunger, S. Subbiah, W. Hendrickson.
 Knowledge-based methods of structure determination and analysis:
 A. Jones, R. Salemme, S. Muskal.
 Accuracy in structure determination:
 D. Eisenberg.
 Principles of protein structure and folding and the role of H-bonds and solvent:
 G. Rose, P. Kim, G. Jeffrey, M. Sundaralingam.
 Macromolecular recognition and interaction:
 D. Davies, R. Brennan, P. Sigler, T. Steitz.
 NMR versus crystallography:
 B. Reid, I. Kunz.
 Protein engineering and rational drug design:
 R. Fletterick, S. Ealick.
 New structures (partial listing):
 D. McKay, H. Eklund, B. C. Wang, S. J. Remington, T. Alber, R. Stroud.

Molecular Genetics

Salve Regina College

R. M. Evans, chairperson; R. Tjian, vice chairperson

23–27 July

Structure and function of transcription factors:
 A. Klug, M. Ptashne, R. Tjian
 Transcriptional regulation of inducible genes:
 M. G. Rosenfeld, R. Evans, R. Roeder, J. Goldstein, T. Maniatis.
 Genes governing pattern formation:
 R. Horvitz, G. Struhl.
 Molecular genetics of development and differentiation:
 G. Rubin, C. Goodman, T. Jessel, H. Weintraub.
 Analysis of gene regulation in transgenic mice:
 S. Tilghman, P. Gruss, D. Hanahan, P. Leder.
 Cell cycle control, protein kinases and mechanisms of signal transduction:
 T. Hunter, T. Roberts, M. Wigler, S. Reed.
 Mechanisms of DNA replication in animal cells and viruses:
 T. Kelly, M. Botchan, G. Wahl.
 RNA processing and splicing:
 D. Rio, M. McKeown.
 Cell surface receptors and protein secretory pathways:
 R. Schekman, G. Blobel, R. Williams.

Motile and Contractile Systems

Plymouth State College (S)

H. L. Yin, chairperson; E. D. Salmon, vice chairperson

23–27 July

Microtubule assembly mechanisms: Dynamic instability and treadmilling:
 E. Salmon, T. Mitchinsen, N. Cowan, G. Borisy, C. Rieder.
 Signal transduction: Membrane cytoskeletal interactions:

T. P. Stossel, O. Stendahl, D. Soll, J. Condeelis.
 Actin binding proteins: Homologies and active sites:
 H. L. Yin, J. Hartwig, A. Noegel, J. Kendrick-Jones.
 Dynamics of the cytoskeleton:
 D. L. Taylor, S. Smith, Y. L. Wang, M. Sheetz.
 Cytoplasmic actin based motors:
 T. Pollard, E. Korn, M. Mooseker, J. Hammer, M. Titus.
 Muscle and cytoskeletal development:
 L. Leinwand, R. Waterston, J. Lin, E. Fyrberg.
 Cytoplasmic microtubule motors:
 R. McIntosh, R. Vale, R. Vallee, L. Goldstein, S. Brady.
 Film session; poster review.
 Genetic approaches to probing motile functions in vivo:
 J. Spudich, D. Cleveland, N. Hirokwa, D. Louvard.

Multiphoton Processes

Colby-Sawyer College (N)

P. Lambropoulos, chairperson; T. Baer, vice chairperson

11–15 June

P. Lambropoulos, discussion leader
 C. K. Rhodes, "Intense laser fields: New effects in molecular excitation and propagation."
 L. J. Frasinski, "Coulomb explosion of molecules in intense laser fields."
 P. M. Dehmer, "Decay dynamics of excited states of diatomic molecules."
 S. D. Colson, discussion leader
 E. R. Grant, "State-selected dynamics of vibrational autoionization: Choosing modes to direct polyatomic fragmentation at 10 ev."
 L. F. DiMauro, "Atomic and molecular structure in intense nonresonant laser fields."
 S. N. Dixit, discussion leader
 V. McKoy, "Rotational and vibrational distribution in molecular REMPI."
 B. A. Bushaw, "Structure and dynamics from high resolution (10 MHz) spectra of small molecules."
 K. C. Kulander, "Time-dependent theory of electron and photon emission by atoms in an intense short-pulsed laser."
 T. J. McIlrath, discussion leader
 P. Agostini, "Resonant multiphoton ionization with intense femtosecond pulses."
 T. F. Gallagher, "Multiphoton processes with dimethoxy photons."
 A. L'Huillier, "Perspectives in high-order harmonic generation."
 S. E. Harris, "Lasing without inversion."
 L. A. Lompre, discussion leader
 P. B. Corcum, "Above threshold ionization in strong ponderomotive potentials."
 H. B. van Linden van den Heuvel, "Ionization and dissociation of H₂ in strong radiation fields."
 R. N. Compton, discussion leader
 M. G. White, "Molecular photoioniza-

tion studies with coherent VUV radiation."

T. Baer, "Molecular conformations studies by 2+1 REMPI."
 I. Powis, "Probing polyatomic photo-fragments by REMPI."
 H. S. Carman, Jr., "Multiphoton excitation, ionization and reaction involving alkali atoms."
 T. Baer, discussion leader
 T. Ebata, "IVR of weakly bound complexes through stimulated emission ion dip spectroscopy."
 D. Charalambidis, "Probing collisions through multiphoton ionization."

Muscle Contraction

Tilton School

R. Cooke, chairperson; J. A. Spudich, vice chairperson

30 July–3 August

Introduction to conference: A. Huxley
 Myosin: Structure and function: R. Yount, chair
 I. Rayment, "The structure of the myosin head determined at 5 Å resolution from crystals of subfragment-1."
 K. Sutoh, "The structure of the actomyosin interface."
 Unconventional myosins and microtubule motors: R. Vale, chair
 J. Hammer, "Nonfilamentous myosins in amoeba: Genetics and function."
 L. Goldstein, "Kinesin: Structure and function."
 P. Matsudairo, "Calmodulin regulation of myosin I."
 Thin filament: Structure and function: K. Holmes, chair
 W. Kabsch, "The high-resolution structure of the actin monomer."
 S. Hitchcock, "Site-directed mutations in the relaxing proteins."
 A. Gordon, "Modulation of thin-filament function by both Ca and myosin crossbridges."
 Molecular biology: Assembly and function of the myofibrillar proteins: L. Leinwand, chair
 J. Spudich, "Genetics approaches to the function of myosin in the amoeba *D. discoideum*."
 E. Fyrberg, "Functional effects on cell motility of deleting genes for contractile proteins."
 K. Campbell, "Properties of dystrophin."
 The actomyosin interaction in solution: Kinetics and structure: C. Bagshaw, chair
 E. Reisler, "Properties of the actomyosin complex in the presence of ATP."
 K. Trybus, "Regulation of the interaction of smooth muscle myosin and actin."
 B. Brenner, "Correlations between the kinetics of the actomyosin interaction in solution and in fibers."
 In vitro measurements of force and velocity: M. Sheetz, chair
 J. Howard, "Movement of microtubules by single molecules of kinesin."
 J. Sellers, "Movement of actin fila-

ments by myosin filaments."

T. Yanagida, "Measurement of the force generated by one actin filament."

Mechanics of fiber contraction: M. Schoenberg, chair

E. Homsher, "Photorelease of phosphate in active muscle fibers, the kinetics of phosphate binding to the active site on myosin."

R. Moss, "The role of the thick filament in the regulation of muscle activation."

Y. Goldman, "Muscle crossbridge kinetics studied using caged nucleotides."

Crossbridge structure in fibers: R. Cooke, chair

J. Squire, "X-ray diffraction, evidence for two attached states of myosin in active fibers."

D. Thomas, "Spectroscopic evidence for motion of myosin heads attached to actin."

T. Wakabayashi, "Configuration of crossbridges in active fibers observed by electron microscopy after fast freezing."

Summary:

H. Huxley, "Structure and function of the contractile proteins."

E. Taylor, "Fiber physiology and biochemistry of the contractile proteins."

J. Sparrow, "Molecular biology of the myofibrillar proteins."

Mutagenesis

Plymouth State College (N)

G. Walker, chairperson; T. Kunkel, vice chairperson

9-13 July

Mechanistic basis of DNA polymerase fidelity: C. McHenry, chairperson; T. Kunkel, discussion leader

L. Beese, K. Johnson, M. Goodman. Detailed mechanisms of accurate DNA repair: T. Lindahl, chairperson; B. Dimple, discussion leader

L. Grossman, M. Sekiguchi.

Mismatch repair: M. Fox, chairperson; M. Radman, discussion leader

M. Michaels, P. Modrich, J. Jiricny. Origins of spontaneous mutagenesis: J. Drake, chairperson; F. Stahl, discussion leader

P. Foster, B. Hall, R. Schaaper.

Lesion structure and mutagenesis: J. Essigman, chairperson; E. Loechler, discussion leader

R. Fuchs, D. Patel, Z. Livneh.

SOS mutagenesis: E. Witkin, chairperson; B. Bridges, discussion leader

H. Echols, J. Battista, C. Lawrence. Advances in eucaryotic DNA repair: P. Hanawalt, chairperson; L. Samson, discussion leader

E. Friedberg, J. Hoeijmakers, A. van Zeeland.

Recent developments in mutagenesis: L. Loeb, chairperson; B. Strauss, discussion leader

Mechanistic and structural implications of mutational specificity: B. Glickman, chairperson; L. Ripley, discussion leader

N. Drinkwater, W. Thilly, K. Breslauer.

Natural Products

New Hampton School

G. D. Prestwich, chairperson; R. P. Volante, vice chairperson

Molecular Diversity in Natural Products Chemistry

23-27 July

S. L. Schreiber, "Molecular recognition of biological receptors."

H. A. Kirst, "Discovery of a novel fermentation product with useful biological activity."

C. D. Poulter, "Isopentyl diphosphate to farnesyl diphosphate. Hot potatoes for early enzymes in the isoprene pathway."

G. D. Diana, "The molecular interaction of antiviral agents with human rhinovirus."

D. Hilvert, "Design of enzymatic catalysts."

B. Glese, "Biomimetic syntheses with carbohydrate radicals."

C.-H. Wong, "Enzymes in organic synthesis: From chiral synthons to sugars and peptides."

R. M. Williams, "Bioorganic, mechanistic and synthetic chemistry of biologically significant nitrogenous substances."

S. G. Withers, "Glycoside hydrolases: New approaches to an understanding of their mechanisms."

O. Hindsgaul, "Molecular recognition of carbohydrates by glycosyltransferases."

S. E. Denmark, "Stereochemical studies on aldol condensation and related carbonyl addition reactions."

R. E. Moore, "New natural products from blue-green algae: Structure and biosynthesis."

K. Tachibana, "Molecular behavior of the active principles in the chemical defense of pardachirid soles."

N. A. Saccomano, "Polyamine and polypeptide toxins isolated from spider venoms."

B. Imperiali, "Unnatural amino acid residues in the investigation of protein function and design."

C. A. Townsend, "Construction of β -lactam antibiotics: Diverse chemical solutions to a convergent evolutionary function."

G. L. Verdine, "Engineering DNA structures."

G. L. Trainor, "Chemical reagents for molecular biology."

M. Hiram, "New aspects in the chemistry of neocarzinostatin complex."

R. Funk, "Application of Claisen rearrangement-mediated ring contractions in the synthesis of bridged natural products."

W. Boland, "Biosynthesis of terminally unsaturated hydrocarbons in plants and insects."

Nuclear Chemistry

Colby-Sawyer College (N)

W. U. Schroder, chairperson; J. D. Garrett, vice chairperson

18-22 June

B. B. Back, discussion leader

Y. Lazarev, "Beta-delayed fission of preactinide nuclei: Discovery and prospects."

R. G. Stokstad, "Basics below the barrier: Current problems in subbarrier fusion."

J. Toke, "Excitation energy division in damped heavy-ion collisions."

R. H. Siemssen, discussion leader

R. Vandenbosch, "Non-equilibrium emission of light particles."

H. Homeyer, "Dissipative projectile fragmentation systems at 18 to 20 MeV/u."

A. Gavron, discussion leader

D. Hinde, "Pre-scission neutron emission in heavy-ion fission."

D. Guerreau, "Hot nuclei: Limiting thermal energy deposit, competing decay channels."

C. K. Gelbke, "Complex-fragment emission and correlation studies for intermediate-energy heavy-ion reactions."

W. Benenson, discussion leader

J. A. Pinston, "Hard-photon production in nuclear reactions."

U. Mosel, "Particle probes of heavy-ion reaction dynamics."

G. F. Bertsch, discussion leader

G. Wozniak, "Binary and multifragment emission from hot, massive nuclear systems."

Panel discussion: The physics of nuclear disassembly: J. Aichelin, D. H. E. Gross, C. Ngo, J. Randrup

W. Norenberg, discussion leader

E. Suraud, "Application of the Boltzmann-Langevin equation to heavy-ion collisions below $E/A < 100$ MeV/u: Fluctuations and dynamically induced fragment formation."

K. Aleklett, "Heavy fragment properties in intermediate-energy heavy-ion gold interactions."

L. G. Moretto, discussion leader

L. Tassan-Got, "Transfer and dissipation in the Fermi-energy domain."

C. LeBrun, "Fragment production in Kr+Ag, Au, Th collisions at 27 and 43 MeV/u and the nuclear matter flow."

W. Trautmann, "Fragmentation in $^{40}\text{Ar}+^{197}\text{Au}$ at $E/A = 200$ MeV."

J. D. Garrett, discussion leader

A. Babloyantz, "Self-organization: From molecules to neurons."

P. Siemens, discussion leader

A. M. Poskanzer, "Squeeze-out."

S. Nagamiya, "Recent progress in studies of relativistic and ultra-relativistic heavy-ion collisions."

Nuclear Proteins, Chromatin Structure and Gene Regulation

Tilton School

J. Gottesfeld, chairperson; R. Kornberg, vice chairperson

23-27 July

Chromatin structure and assembly (in memory of Abe Worcel): R. Kornberg, discussion leader

J. Widom, "Structures and mechanisms of chromatin folding."

R. Laskey, "Control of DNA replication in reconstituted nuclei."

B. Simpson, "Nucleosome positioning and chromatin function."

DNA conformation and topology: J. Wang, discussion leader

D. Crothers, "DNA topology in transcription complexes and chromatin."

L. Liu, "DNA helix-tracking processes."

Chromosome structure: Telomeres and centromeres: E. Blackburn, discussion leader

B. Daneholt, "Ultrastructure of an active Balbiani ring gene."

J. Sedat, "Three-dimensional nuclear structure."

B. Hamkalo, "Chromosomal organization of mouse centromeric and telomeric DNAs."

Nuclear structure and cell cycle: U. Laemmli, discussion leader

J. Newport, "The role of DNA in cell cycle regulation."

E. Nigg, "Postsynthetic modification of the nuclear lamina during the cell cycle."

Chromatin structure of active genes: S. Elgin, discussion leader

P. Schedl, "Higher order chromatin domains."

B. Garrard, "Gene organization in the nucleus."

M. A. Osley, "The effects of histone dosage and histone mutations on the transcription of histone and other genes in yeast."

DNA binding proteins and protein-DNA interactions: A. Klug, discussion leader

S. Harrison, "Structural studies of transcriptional regulatory proteins."

C. Pabo, "Structural motifs in protein-DNA interaction."

Nuclear organization of RNA processing components: T. Maniatis, discussion leader

A. Beyer, "Ultrastructure of splicing."

J. Abelson, "Messenger RNA splicing in yeast."

J. Gall, "SnRNPs in the germinal vesicle."

Transcriptional apparatus: R. Roeder, discussion leader

M. Green, "Mechanisms of viral and cellular transcription activators."

J. M. Egly, "An RNA polymerase II (B) general transcription factor."

Transcriptional regulation: L. Guarante, discussion leader

R. Schlieff, "Opening and shifting DNA loops."

M. Grunstein, "Regulation of transcription by histones in vivo."

G. Felsenfeld, "Developmental regulation of chicken globin gene expression."

Nucleic Acids

New Hampton School

L. Gold and J. E. Dahlberg, co-chairpersons

11-15 June

RNA structure and function: O. Uhlenbeck, discussion leader

D. Santi, I. Tinoco, C. Tuerk.

RNP structure and function: C. Guthrie, discussion leader

J. Abelson, T. Maniatis, H. Noller, P. Walter.

High resolution RNA and RNP structures: T. Steitz, discussion leader
D. Crothers, D. Moras.

RNA metabolism: M. Wickens, discussion leader

M. McKeown, C. Rosen.

Replication and transcription: L. Rothman-Denes, discussion leader
E. P. Geiduschek, M. Salas, B. Stillman.

High-resolution DNA and DNA-protein structures: P. Sigler, discussion leader

R. Klevit, C. Pabo, S. Phillips.

DNA rearrangements: G. Smith, discussion leader

N. Sternberg, K. Thomas.

Genome structure: R. Laskey, discussion leader

A. Bird, B. Hickie.

Nucleic acid therapeutics and diagnostics: B. Wold, discussion leader
D. Gelfand.

Order and Disorder in Solids

Colby-Sawyer College (S)

H. L. Strauss, chairperson; R. Pick, vice chairperson

13-17 August

H. L. Strauss, discussion leader

V. Heine, "Long-range interactions which lead to SiC polytypes."

S. C. Moss, "Stacking disorder in an incommensurately modulated superconductor."

M. Widom, "Quasicrystals: Between crystal and glass."

R. M. Pick, discussion leader

R. Bozio, "Charge transfer systems."

A. Fuchs, "Premelting phenomena in orientationally disordered polycrystalline materials."

G. W. Garland, discussion leader

A. J. Sievers, "IR hole burning in crystals and glasses."

J. Tse, "Anomalous thermal properties of crystalline solids."

S. Califano, "Vibration and disorder."

I. Silvera, "High-pressure phases of H₂."

J. Eckert, "Rotation of H₂ in transition metal compounds."

R. D. Weir, discussion leader

J. Berret, "Dynamics in mixed crystals."

R. Blinc, "Deuteron glasses."

A. J. Dianoux, "Molecular motion by neutron scattering."

M. A. White, discussion leader

Y. Ishibashi, "Order/disorder phenomena in structural phase transitions."

J. W. Cahn, "Diffusional ordering mechanisms in alloys."

J. White, discussion leader

H. Moehwald, "Order and phase transitions in monolayers."

D. A. Pink, "Lipid bilayers."

K. Knorr, "Orientational ordering in monolayers."

A. Angell, "Ionic conductivity, dielec-

tric relaxation and glass formation of plastic crystal systems."

A. Inaba, "Structure and heat capacity of the absorbed monolayers of some single molecules."

R. M. Lynden-Bell, "Simulations of order/disorder phenomena in absorbed films I."

W. A. Steele, "Simulations of order in physisorbed films II."

Organic Geochemistry

Holderness School

M. Schoell, chairperson; J. K. Whelan, vice chairperson

13-17 August

Water column processes: S. G. Wakeham, discussion leader

V. Ittekkot, "Organic geochemistry of rivers flowing into the Indian Ocean."

D. Hollander, "Carbon isotope cycling and productivity in lacustrine and marine environments."

S. G. Wakeham, "Organic matter cycling in the oceanic column."

Preservation/degradation of organic matter: L. Ten Haven, discussion leader

T. Pedersen, "Do oxygen minima promote accumulation of organic carbon-rich sediments?"

S. Emerson, "The role of oxygen in the preservation of organic matter in the ocean."

J. K. Volkman, "Degradation and preservation of marine and terrestrial lipids in sediments."

Biomarker reactions during early diagnosis: J. W. de Leeuw, discussion leader

T. S. Sinnighe, "The quenching of labile biomarkers by inorganic sulfur species."

T. Peakman, "Towards double-bond isomerization and methyl shifts in biological marker components during early diagnosis."

G. Eglinton, J. W. de Leeuw, "The fate of functional groups in biomolecules. What do we know?"

Age-related biomarkers in petroleum: J. M. Moldowan, discussion leader

R. Summons, "Sedimentary hydrocarbon assemblages which change as a function of geological age."

J. M. Moldowan, "Tracing the geologic age constraints on biomarkers."

Isotopic composition of organic matter at the molecular level: J. M. Hayes, discussion leader

K. H. Freeman, Delta ¹³C of individual biomarkers, implications concerning the origins of sedimentary organic matter."

M. Schoell, "Compound specific isotope analysis in crude oils."

Role of organic acids in geological processes: M. D. Lewan, discussion leader

E. Shock, "Organic acid metastability in sedimentary basins."

J. B. Fisher, "Organic acids and secondary porosity."

Migration of oil and gas: W. England, discussion leader

D. Leythaeuser, "Geochemical effects and mechanisms of petroleum expulsion from source rocks of clastic

and carbonate lithologies."

L. Price, "New data, new insights, and new working hypotheses on primary migration."

W. A. England, "The relationship between petroleum migration and inherited compositional variations in reservoir fluids."

Reservoir geochemistry: W. Dow, discussion leader

K. F. M. Thompson, "Light end alteration in and between reservoirs."

R. J. Hwang, "Reservoir continuity and oil composition variation."

S. Larter, "Reservoir geochemistry—a view from the heavy end."

Elected best posters for oral presentation: J. K. Whelan, discussion leader

Organic Reactions and Processes

New Hampton School

W. F. Berkowitz, chairperson; T. V. Rajan Babu, vice chairperson

16-20 July

P. S. Mariano, "New reaction processes based on photochemical electron transfer."

G. Pattenden, "Free radical-mediated reactions using organocobalt reagents."

J. J. Bronson, "Synthesis of carbocyclic nucleoside analogs."

M. Okabe, "AIDS-driven chemistry of dideoxynucleosides."

K. Mikami, "'Chemzyme' for carbon-yl-ene reactions."

L. F. Tietze, "Tandem-Knoevenagel hetero-Diels-Alder and ene reactions."

J. Rigby, "Transition metal-modified reactivity of cyclic trienes."

R. K. Boeckman, Jr., "New methodology and applications to the construction of complex molecules."

S. Rozen, "Fluorine as a reagent in general organic chemistry."

A. W. Mazur, "5-C-Hydroxymethyl hexoses: A new class of non-caloric carbohydrates."

M. Lautens, "Metal-catalyzed homo-Diels-Alder reactions for the synthesis of polycycles."

T. Hoye, "Metal-carbene-mediated transformations as a stepping stone to new organic chemistry."

G. Cahiez, "Organomanganese reagents: Good tools for the elaboration of new selective synthetic methods."

S. L. Buchwald, "Zirconocene complexes in organic synthesis."

D. H. R. Barton, "The invention of chemical reactions."

Y. Ohfun, "Design, syntheses and neuroexcitatory actions of conformational variants of L-glutamate analogues."

R. M. Williams, "The mechanism of oxygen reduction by quinocarcin."

R. M. Moriarty, "Hypervalent iodine in organic synthesis."

R. N. Murray, "Dioxiranes: Versatile oxygen transfer reagents."

E. F. Silversmith, "The name game."

T. Blacklock, "Asymmetric syntheses of 5,6-dihydro-4H-thieno[2,3b]thio-

pyrans: A class of potent carbonic anhydrase inhibitors."

R. W. Franck, "The Bradsher cycloaddition of isoquinolinium salts."

T. C. Barden, "Synthetic modification of LL-F28249α."

W. Schreiber, "Some interesting tenoid rearrangements."

Organometallic Chemistry

Salve Regina College

R. G. Bergman, chairperson; A. P. Sattelberger, vice chairperson

25-29 June

Exploratory organometallic synthesis, reactivity, and mechanisms: D. Forster, chair

H. Berke, "How to make transition metal hydrogen bonds more reactive: A conceptual approach and its experimental consequences."

T. C. Flood, "Mechanisms of bond activations by soluble complexes of iridium and osmium."

J. E. Ellis, "New synthetic routes to highly reduced organometallics."

Applications to organic synthesis and/or chiral organometallic chemistry: R. J. Piccolini, chair

Y. Ito, "Asymmetric aldol reactions of α-isocyanocarboxylates and related isocyanide derivatives catalyzed by chiral IB metal complexes."

N. J. Cooper, "The application of diastereomeric tungstenocene complexes containing chiral metal centers to the study of organometallic reactions."

S. E. Thomas, "Reactivity of hetero-adiene metal carbonyl complexes."

Main group organometallic chemistry: J. E. Bercaw, chair

P. Jutzi, "π-Complexation in main group chemistry—some recent results."

L. R. Sita, "New chemistry of polycyclic organostannanes."

G. Parkin, "Poly(pyrzoly)hydroborato alkyl derivatives of s- and p-block metals."

Organometallic sulfur chemistry: E. R. Evitt, chair

T. B. Rauchfuss, "Studies on organoruthenium and organorhodium sulfides."

R. J. Angelici, "Reactions of thiophene in organometallic complexes."

E. J. M. de Boer, "Reactions of rhenium oxides with alkynes."

Materials, solid state, polymers: J. P. Fackler, Jr., chair

H. D. Kesz, "Deposition of transition metal thin-films from organometallic precursors."

R. D. Miller, "Soluble high molecular weight polysilanes: Science and applications."

R. G. Nuzzo, "The molecular self-assembly of organic thiols on Au(111) and the application of these materials in condensed phase studies."

Lanthanides, actinides, etc.: B. D. Dombek, chair

T. J. Marks, "New homogeneous catalysis with organolanthanides."

J. C. Stevens, "Selective propylene dimerization catalyzed by organour-

anium compounds."

F. G. N. Cloke, "High- and low-oxidation state organo-f-element compounds derived from bulky aromatic ligands."

Techniques, theory: C. M. Friend, chair

J. D. Simon, "Picosecond studies of the photodissociation of chromium hexacarbonyl."

S. T. Ceyer, "The activation of CH₄ and the synthesis of C₆H₆ from CH₄ on Ni(III)."

C. M. Lieber, "Scanning tunneling microscopy studies of the structural and electronic effects of metal substitution in inorganic materials."

Inspirations: M. L. H. Green, chair

J. A. Osborn, "Catalysts for the chemo- and enantio-selective reduction of imines."

H. B. Gray, "Binuclear iridium and platinum photochemistry and photocatalysis."

Methane, alkane chemistry: P. L. Watson, chair

B. B. Wayland, "C-H bond reactions of Rh(II) and Ir(II) porphyrin complexes."

D. M. Heineky, "Reactions of methane with rhenium complexes."

J. A. Labinger, "Practical approaches to alkane activation: From methane monooxygenase to organometallic."

Six oral presentations will be selected on the first day from the poster submissions.

Origin of Life

Plymouth State College (N)

J. F. Kasting, chairperson; A. W. Schwartz, vice chairperson

13-17 August

S. Chang, discussion leader

M. A'Hearn, "Composition of comets."

D. Cruikshank, "The Mars Phobos Mission."

D. Stevenson, "Magma oceans and the Earth's volatile inventory."

K. Zahnle, discussion leader

M. Greenburg, "Chemical evolution in interstellar space and transport to Earth via comets."

C. Chyba, "Impact delivery of water and organic material."

H. Holland, discussion leader

N. Sleep, "Impacts and early life."

D. Lowe, "Geological constraints on the Archean environment."

J. Grotzinger, "Carbonates, stromatolites, and Precambrian seawater."

J. Lake, discussion leader

N. Pace, "Phylogenetic perspective and the earliest life forms—then and now."

M. Sogin, "Phylogeny of protists."

J. Kasting, discussion leader

H. Holland, "Precambrian atmosphere and oceans: Evidence from paleosols."

D. DesMarais, "Carbon isotopes in Precambrian rocks."

B. Pierson, "Effects of UV radiation on modern and ancient organisms."

N. Pace, discussion leader

H. Morowitz, "The first evolutionary radiation."

R. Buick, "The early Archean fossil record."

A. Schwartz, discussion leader

G. Joyce, "RNA evolution."

M. Yarus, "The origin of the genetic code."

D. Usher, "Peptide synthesis and catalytic RNA."

H. Morowitz, discussion leader

D. Deamer, "Biophysical properties of primitive organic compounds."

T. Haines, "Were nucleic acids necessary for the emergence of life on Earth?"

J. Ferris, discussion leader

D. Mauzerall, "Photochemical reduction of water and bicarbonate."

E. Shock, "Carbon fixation in hydrothermal systems."

S. Miller, "Prebiotic organic synthesis: Earth or space?"

Particle-Solid Interactions

Holderness School

M. L. Swanson, chairperson; R. Kelly, vice chairperson

9-13 July

R. Kelly, discussion leader

K. G. Lynn, "Positron-surface interactions."

A. W. D. van der Gon, "Surface melting."

W. Heiland, "Surface channeling."

W. M. Gibson, discussion leader

L. C. Feldman, "Ge/Si multilayers."

R. M. Tromp, "Effect of impurities on heteroepitaxy."

R. E. Johnson, discussion leader

P. Hakansson, "Sputtering of bioorganics."

G. Marletta, "Ion-induced chemical modification of polymers."

R. P. Sharma, "Phonon anomaly."

O. Meyer, "Ion damage effects."

J. U. Andersen, discussion leader

H. H. Mikkelsen, "Stopping power of charged particles."

J. Burgdorfer, "Convoy electrons."

N. Itoh, to be announced.

P. Pigmund, discussion leader

Y. Quere, "High-energy damage effects."

S. T. Picraux, discussion leader

E. Chason, "Ion beam-enhanced epitaxy."

A. Rockett, "Beam-assisted doping."

W. L. Brown, "Cluster beam deposition."

R. J. Beuhler, "Cluster impact fusion."

B. H. Cooper, "Scattering of low energy ions."

D. O. Boerma, "Surface diffusion studied by low energy ion scattering."

Peptide Growth Factors

Salve Regina College

G. N. Gill, chairperson; D. R. Clemmons, vice chairperson

6-10 August

Sunday evening keynote address: D. Hanahan, "Development of growth factor and receptor systems."

Signaling by tyrosine kinase growth factor receptors: G. N. Gill, discussion leader

G. N. Gill, "Epidermal growth factor receptor."

R. Derynck, "Tumor growth factor α ."

L. Rorschneider, "Macrophage colony-stimulating factor 1 receptor."

Receptors mediating growth and differentiated function: L. T. Williams, discussion leader

L. T. Williams, "Fibroblast growth factor receptor."

D. Julius, "Serotonin receptor."

Growth inhibitors: H. L. Moses, discussion leader

H. L. Moses, "Tumor growth factor β ."

J. Massague, "Tumor growth factor β ."

I. S. Trowbridge, "Transmembrane tyrosine phosphatases."

Regulation of early development: J. Smith, discussion leader

J. Smith, "Growth factor control of mesodermal development."

J. Heath, "Growth factor expression during early development."

Signal transducing pathways: F. McCormick, discussion leader

F. McCormick, "GAP, ras proteins signal transduction."

G. Carpenter, "Substrates for ligand-activated tyrosine kinases."

S. Sazer, "Maturation-promoting factor and the cell cycle."

Growth suppressor genes: W.-H. Lee, discussion leader

W.-H. Lee, "The Rb gene."

D. E. Housman, "Wilms tumor gene."

Insulin-like growth factors: D. R. Clemmons, discussion leader

D. R. Clemmons, "Insulin-like growth factor 1 enhancers."

D. LeRoith, "Regulation of translation of insulin-like growth factors."

P. Rotwein, "Differentiation and expression of IGFs and their receptors."

M. G. Rosenfeld, "Pou domain proteins in growth and development."

Regulation of gene transcription: I. Verma, discussion leader

I. Verma, "fos/jun regulators of transcription."

U. Muller, "Regulation of viral transcription."

M. Montminy, "cAMP response element binding protein."

Photonuclear Physics

Tilton School

R. J. Holt, chairperson; L. C. Maximon and S. Boffi, vice chairpersons

6-10 August

Z. E. Meziani, "Nucleons in nuclei: What is new?"

C. Horowitz, "Electromagnetic currents in relativistic models."

M. Soyeur, "Missing strength in the longitudinal electron response in nuclei."

B. Schoch, "Recent results of photoproduction of pions on the nucleon."

G. Fournier, "Electroproduction of pions on the proton near threshold: Measurement of the axial form factor of the proton."

R. McKeown, "Neutral weak form factors of the nucleon."

H. Blok, "Beyond (e,e'p): Study of correlated nucleon knockout with the (e,e'd) and (e,e'pp) reactions."

D. Ryckbosch, "Light-cluster knockout studies with tagged photons."

T. Suda, "Multi-nucleon photoabsorption studies."

N. Burkova, "Cluster models in light nuclei."

S. G. Popov, "Measurements of analyzing powers in electro-disintegration and electron elastic scattering from the deuteron."

W. Turchinets, "Measurement of t_{20} in electron-deuteron scattering."

H. Arenhovel, "Electromagnetic breakup of the deuteron."

M. Taiuti, "Experimental activities with the new 1.2-GeV tagged photon beam at the Frascati Laboratories."

E. Booth, "Nuclear Compton scattering in the delta region."

H. E. Jackson, "Is there a pion excess in nuclei?"

J. C. Peng, "Anti-quark and gluon structures in nuclei."

J. Ralston, "Color transparency."

D. Geesaman, "Virtual photon-induced hadron propagation in nuclei."

P. Souder, "Measurement of parity violation in polarized electron scattering from carbon."

A. Magnon, "Separation of structure functions and high momentum components from (e,e'p) reactions on light nuclei."

L. Weinstein, "Electron scattering reaction mechanism studied by (e,e'p)."

C. C. degli Atti, "Theoretical descriptions of nucleon-nucleon correlations in quasielastic and deep inelastic lepton scattering."

J. Tjon, "Relativistic one-boson exchange models."

G. Karl, "Photoproduction of nucleon resonances: Physics and history."

R. Milner, "Physics with internal targets in electron rings."

B. Frois, "Electromagnetic physics in Europe: Prospects for the 1990's."

L. Cardman, "Electromagnetic physics in the Americas: Prospects for the 1990's."

Biochemical Aspects of Photosynthesis

Colby-Sawyer College (N)

W. A. Cramer, chairperson; R. E. Blankenship, vice chairperson

16-20 July

The bacterial reaction center: H. Michel, chairperson

I. Sinning, "Structure of quinone niche mutants."

M. Okamura, "Mutants affecting H⁺ translocation."

C. Schenck, "Asymmetry studied by mutagenesis."

Discussion leaders: C. Kirmaier, D. Tiede

Antenna complexes: B. Andersson, chairperson

W. Kuhlbrandt, "Structure analysis of LHC-II."

P. Loach, "Reconstitution of bacterial LHC."

Discussion leaders: R. Cogdell, B. Green, H. Zuber

The photosystem II reaction center: A. Trebst, chairperson

C. Yocum, "Similarities-differences between bacterial, PSII RC."

Y. Inoue, "Identity and function of small polypeptides."

B. Diner, "Primary donors, secondary acceptors."

Discussion leaders: G. Brudvig, J. Gray.

Water oxidation and manganese: G. Babcock, chairperson

M. Klein, "S state dependence of Mn structure, oxidation state."

W. Vermaas, "Probing the lumen side of the D2 polypeptide by mutagenesis."

Discussion leader: R. Prince, W. Rutherford, N. Murata

The photosystem I reaction center: R. Malkin, chairperson

B. Lindberg-Moller, "Functional characterization of PSI subunits."

J. Golbeck, "Prosthetic groups and functions."

N. Nelson, "Targeted mutagenesis of PSI."

Discussion leaders: D. Bryant, J. Warden

The ATP synthase: R. McCarty, chairperson

G. Falk, "Transcriptional analysis and control of BF_0F_1 ."

P. Graber, "Structure and mechanism of CF_0F_1 ."

Discussion leaders: W. Junge, D. Ort

Cytochrome bc_1 - b_5f complexes: G. Hauska, chairperson

A. R. Crofts, "Genetic and mutagenic analysis of structure-function."

F. Daldal, "Mutagenic analysis of quinone-binding sites."

C.-A. Yu, "Why PQ in chloroplasts and not in mitochondria?"

Discussion leaders: P. Joliot, P. Rich

Molecular mechanisms of proton translocation: G. Feher, chairperson

H. G. Khorana, " H^+ translocation in purple membranes."

M. K. F. Wikstrom, " H^+ translocation in cytochrome oxidase."

Discussion leaders: P. L. Dutton, C. Wraight

Protein import and membrane biogenesis: L. A. Sherman, chairperson

R. Nechushtai, "Import, incorporation of LHC."

S. Theg, "Energetics of the import process."

F.-A. Wollman, "Assembly-disassembly in *C. reinhardtii*."

Discussion leader: B. Marrs, K. Cline

Physical Electrochemistry

Colby-Sawyer College (S)

J. O'M. Bockris, chairperson; H. C.

Abruna, vice chairperson

30 July-3 August

The structure of the interfacial region: D. Schiffrin, chairman

F. Silva, T. Kakiuchi, S. G. A. McLaughlin, A. A. Kornyshev.

Experimental approach to quantum aspects of the double layer: J. T. Hupp, chairman

A. Nozak, K. Koval, J. T. Hynes, A. J. Heager.

Nuclear electrochemistry: S. Pons, chairman

R. A. Huggins, A. A. Wadsworth, R. Oriani, M. MacKubre

New experimental methods in electrochemistry: W. O'Grady, chairman

F. Wagner, E. Stuve, R. Corn, B. Schardt.

Bioelectrochemistry: A. Heller, chairman

H. R. O. Hill, I. Karube, J. J. Kulys.

Plant Molecular Biology

Proctor Academy

M. J. Chrispeels, chairperson; C. J. Lamb, vice chairperson

18-22 June

C. J. Lamb, discussion leader

J. Denarie, "Symbiotic signals from *Rhizobium*."

U. Goodenough, "Sexual signaling in *Chlamydomonas*."

J. Nasrallah, "Signaling self and non-self."

J. Chory, discussion leader

W. Briggs, "Light as a signal for development."

C. Kung, "Pressure-sensitive channels in yeast."

R. Crain, discussion leader

S. Long, "Genetic and cellular analysis of plant-*Rhizobium* symbiosis."

W. Boss, "Inositol phospholipids as second messengers."

J. Schroeder, "Ion channels and cytosolic calcium mediate cell signaling."

P. Hepler, discussion leader

P. Hepler, "Calcium and the regulation of mitosis."

P. Low, "Signal transduction by elicitors."

N. Raikhel, discussion leader

M. Chrispeels, "Sorting in the secretory system."

P. Staswick, "Physiological signals for vegetative storage protein accumulation."

N. Raikhel, "Protein targeting to the vacuole."

A. Bennett, discussion leader

K. Apel, "Leaf thionins: New plant defense proteins."

R. L. Jones, "Regulation of calcium flux by gibberellic acid."

S. Howell, discussion leader

T. Lomax, "Auxin receptors."

A. Jones, "Auxin binding proteins."

H. Kende, "Signal transduction in ethylene mediated responses."

M. Chrispeels, discussion leader

K. Hahlbrock, "From fungal elicitor via the cell membrane to nuclear

gene activation."

D. McCarthy, "Role of the vp-1 gene in ABA signal transduction."

K. Hahlbrock, discussion leader

C. Lamb, "Integration of developmental and environmental signals."

M. Yanofsky, "Flower development in *Arabidopsis thaliana*."

E. Coen, "Floral homeotic genes in *Antirrhinum*."

Plasma Chemistry

Tilton School

A. V. Phelps, chairperson; D. R. MacRae, vice chairperson

13-17 August

J. Mostaghimi, "Modeling of kinetic nonequilibrium and flow turbulence in thermal plasmas."

C. H. Kruger, "Nonequilibrium in thermal plasma chemistry: Experiments and models."

H. Sawin, "Measurements and modeling of plasma chemistry using transient analysis."

R. Burke, "Distributed electron cyrotron resonance for plasma deposition."

T. Yoshida, "Preparation of superconducting oxide films by plasma flash evaporation."

J. W. Fleming, "Isothermal RF plasma applications in fiber optics."

M. Nakamura, "Temperature and impurity effects on reactive ion etching."

Poster session.

W. M. Holber, "Novel aspects of ECR materials processing plasmas."

R. Hernberg, "Local thermodynamic equilibrium in RF induction argon plasma."

R. J. Van Brunt, "Plasma chemical model for decomposition of SF_6 in high-pressure corona."

K. Tachibana, "Production and transport of radicals in processing plasmas."

J. Perrin, "Surface reactions of ions and radicals in plasma and photochemical deposition of hydrogenated amorphous silicon alloys."

R. J. Munz, "How arc behavior and chemistry can shed light on electrode erosion."

J. Pelletier, "A model for plasma etching: Steric and temperature effects."

G. S. Selwyn, "Plasma process contamination: More than a particle in a box."

J. R. Fincke, "Diagnostic techniques for plasma-particle interactions."

A. M. Vardelle, "Particulate vaporization in plasmas and interactions with surfaces."

Polymer Physics

Save Regina College

E. J. Kramer, chairperson; D. S. Pearson, vice chairperson

16-20 July

F. Bates, discussion leader

G. Fredrickson, "Pseudo- and multicritical behavior of block copolymers and their mixtures."

T. Russell, "Neutron reflectivity studies of block copolymers at surfaces and interfaces."

R. Kambour, discussion leader

H. Brown, "Studies of block copolymer effects on adhesion at polymer interfaces."

P.-G. deGennes, "Physical principles of adhesion at polymer interfaces."

D. Pearson, discussion leader

Poster session.

E. Helfand, discussion leader

T. Lodge, "Solvent friction and polymer dynamics."

M. Ediger, "Local segmental dynamics of polymers in solution."

M. Tirrell, discussion leader

H. Rehage, "Polymer chemistry and physics in two dimensions."

Y. Gotlib, "Local and global motions of polymers in thin layers."

J. Klein, discussion leader

B. Widom, "Structure of interfaces between dilute polymer solution phases."

R. Thomas, "Neutron reflection studies of polymers at solution interfaces."

N. Thomas, discussion leader

A. Donald, "Liquid crystallinity, phase separation and gelation in the PBLG-BA system."

R. Larson, "A rheo-optical study of PBLG in the isotropic and liquid crystalline states."

D. Grubb, discussion leader

A. Keller, "Polymer liquid crystals with relevance to chemical tailoring, crystallization and orientation processing: A unifying personal approach."

D. Pearson, discussion leader

K. Schweizer, "Integral equation theory of polymer blends."

T. Hashimoto, "Phase transitions and self-assembling structures of polymer mixtures under shear flow."

Polymers

Brewster Academy

N. G. Gaylord, chairperson; J. Harwood, vice chairperson

2-6 July

N. D. Field, discussion leader

A. J. Ouderkirk, "Surface modification of semicrystalline polymers."

D. S. Dunn, "Characterization of laser-modified polymer surfaces."

D. A. Tirrell, discussion leader

H. K. Hall, Jr., "Bond formation in charge-transfer cycloadditions and polymerizations."

Y. Kissin, "Olefin oligomerization—a tool in the elucidation of chain growth mechanisms with Ziegler-Natta catalysts."

A. Coran, discussion leader

M. Lambla, "Exchange reactions in molten polymers."

K. E. Russell, "Mechanism of grafting of maleic anhydride to molten polyolefins and alkanes."

C. U. Pittman, Jr., discussion leader

T. W. Weidman, "Synthesis, properties and photoreactivity of new silicon and tin frame network polymers."

J. C. W. Chien, "Polymer precursor synthesis of high T_c superconducting fibrils and films."

R. Zand, discussion leader

M. L. Gray, "The functional significance of the polymer structure of cartilage."

D. W. Urry, "New perspectives on entropic elasticity and polymer folding and assembly in water demonstrated by elastomeric polypeptide biomaterials."

E. J. Fleegler, "The needs and shortcomings in biomaterials from the perspective of a surgeon."

E. A. DiMarzio, discussion leader

R. J. Gaylord, "Rubber elasticity: Viscoelastic, equilibrium elastic and swelling properties."

F. Dowell, "Recent prediction and design of the properties of the first super-strong polymers."

V. Stannett, discussion leader

B. Ranby, "Cellulose graft copolymers: Block or graft copolymers?"

T. K. Kwei, "Hydrogen-bonded interpolymer complexes."

R. F. Storey, discussion leader

E. Tsuchida, "Formation of polyphenylenesulfides from diphenyldisulfides via a novel cationic oxidative polymerization process."

J. Kinstle, discussion leader

S. M. Aharoni, "Hydrogen-bonded liquid crystalline poly(esteramides)."

H. L. Frisch, "Interpenetrating polymer networks of PPO."

Postharvest Physiology

Proctor Academy

W. J. Bramlage, chairperson; J. D. Anderson, vice chairperson

9-13 July

D. Grierson, discussion leader

R. Christofferson, "Gene expression changes during ripening."

R. Fischer, "Control of gene expression by ethylene."

K. Osteryoung, "Processing and secretion of ripening enzymes."

A. Bennett, discussion leader

C. Lashbrook, "Functional analysis of cell wall hydrolases in transgenic tomato fruit."

G. Tucker, "Structural analyses of pectins in transgenic tomato fruit with reduced polygalacturonase."

J. Labavitch, "Relationship between cell wall metabolism and the ripening process."

R. Shewfelt, discussion leader

R. McDonald, "Attempting to control chilling injury after harvest."

H. Norman, "Retailing of molecular species of membrane lipids."

J. Thompson, "The role of lipoxygenase in the mechanism of membrane degradation."

B. McKersie, "De-esterification of fatty acids associated with peroxidative degradation."

J. Anderson, discussion leader

A. Theologis, "Regulation of the ACC synthase gene."

A. Bleecker, "Molecular genetic approaches to study ethylene action."

A. Cameron, discussion leader

J. Geeson, "Application of MAP technology."

R. Beaudry, "Measuring RQ changes in MAP systems."

B. Patterson, "Active packaging."

M. Saltveit, Jr., discussion leader

H. Hyodo, "Induction of enzymes and biochemical and metabolic changes in postharvest plant tissue."

W. B. McGlasson, "Effects of wounding on storability and quality."

C. Wilson, discussion leader

M. Heath, "Nonhost and induced disease resistance mechanisms in plants."

R. Broglie, "Manipulating genes for postharvest disease resistance."

E. Chalutz, "Manipulating microbial populations for postharvest disease resistance."

G. Laties, discussion leader

R. Romani, "Understanding the postharvest physiological phenomena."

G. Hobson, "Helping to feed a hungry world."

S. Kays, discussion leader

A. Watada, "Lightly processed—applications and problems."

A. Callahan, "Identifying genes that produce food quality."

W. Hiatt, "Practical applications of antisense messages."

Proteoglycans

Proctor Academy

T. R. Oegema, Jr., chairperson; J. Kimura, vice chairperson

25-29 June

Molecular biology and proteoglycan structure-function: M. Tanzer, chairperson

E. Berg, "A human lymphocyte homing receptor is related to cartilage proteoglycan and link proteins."

A. Oldberg, "Fibromodulin: A unique keratan sulfate proteoglycan."

S. Avraham, "Mouse secretory granule proteoglycan-gene: Identification of regulatory elements within its promoter region."

Hyaluronic acid: C. Knudsen, chairperson

R. Frazer, "Catabolism of hyaluronic acid."

L. Lerner, "The determination of the conformation of hyaluronic acid by two-dimensional NMR."

A. Salustri, "Regulation of hyaluronic acid synthesis during cumulus oophorus expansion."

Sulfation: J. Gallagher, chairperson

A. P. Varki, "N-linked glycosaminoglycans."

J. Silbert, "Studies on chondroitin sulfate sulfation and the use of sulfation inhibitors such as chlorate."

U. Lindahl, "Sulfation of heparin."

Keratan sulfate: H. Greiling, chairperson

M. Fukuda, "Polylactosaminoglycan synthesis and structure."

J. Funderburgh, "Keratan sulfate-proteoglycan from corneal and non-corneal tissues."

I. Nieduszynski, "Structures of skeletal keratan sulfates."

Heparan sulfate proteoglycan: J. Hassell, chairperson

G. David, "Structure of cell surface-associated heparan sulfate proteoglycans from human fibroblasts."

V. Hascall, "Turnover of cell-surface heparan sulfate."

A. Cardin, "Molecular modeling of protein-glycosaminoglycan interactions."

TGF β and proteoglycan synthesis: C. Handley, chairperson

J. Massague, "TGF β -binding proteoglycan."

A. Rapraeger, "TGF β enhances the synthesis of chondroitin sulfate in syndecan."

Small interstitial dermatan sulfate proteoglycans: A. Plaas, chairperson

L. W. Fisher, "Immunolocalization and in situ localization of biglycan (PGI) and decorin (PGII) in growing human tissues."

K. Vogel, "Interactions of small proteoglycans with collagen in tendon."

Y. Yamaguchi, "Decorin: A regulator of cell proliferation."

Special lecture: J. Stow, chairperson

J. E. Rothman, "Mechanism of intracellular protein transport."

Proteoglycan modification and secretion: M. Hook, chairperson

C. Hirshberg, "Mechanism of post-translational modification in the lumen of the Golgi and endoplasmic reticulum."

J. Esko, "Inhibitors of proteoglycan assembly."

R. Linhardt, "Ultrasensitive analysis of glycosaminoglycans aimed at understanding biologically relevant modifications."

Proteolytic Enzymes and Their Inhibitors

Holderness School

A. J. Barrett, chairperson; S. V. Pizzo, vice chairperson

11-15 June

Introduction and serine proteinases I: J. Travis, discussion leader

A. J. Barrett, "Molecular and biological diversity of proteinases."

J. C. Powers, "Serine proteinases: Mechanisms and inhibition."

E. F. Meyer, Jr., "Synthetic inhibitors of leukocyte elastase."

M. G. Grutter, "Structure of the hirudin/ α -thrombin complex."

M. Orlowski, "Multicatalytic proteinase complex."

Serine proteinases II: J. Travis, discussion leader

J. Tschopp, "Lymphocyte cytotoxic proteinases."

D. Hudig, "Cytotoxic lymphocyte-killing mechanism."

Cysteine proteinases I: A. J. Barrett, discussion leader

W. Bode, "Structure of cysteine proteinases and cystatin."

A. C. Storer, "Protein engineering of cysteine proteinases."

E. Shaw, "Inhibitors of cysteine proteinases—design and applications."

K. Suzuki, "Calpains: Structure, activity regulation and functions."

Cysteine proteinases II and others: A. J. Barrett, discussion leader

B. Dunn, "Kinetics and inhibition of viral processing cysteine proteinases."

To be announced, "Proteolytic processing of procollagen to collagen."

Aspartic proteinases I and others: J. Kay, discussion leader

M. O. Liveley, "Chicken oviduct signal peptidase."

G. Shelness, "Dog pancreatic signal peptidase."

I. M. Samloff, "Human gastric aspartic proteinases."

M. N. G. James, "Structure and function of aspartic proteinases."

J. Kay, "HIV and human aspartic proteinases."

Aspartic proteinases II: J. Kay, discussion leader

N. Roberts, "Inhibitors of HIV proteinase."

A. Wlodawer, "Structure of an HIV proteinase/inhibitor complex."

J. Huff, "Design and synthesis of HIV-1 proteinase inhibitor."

C. Debouck, "Retroviral proteinases as therapeutic targets."

Metallo-proteinases I: J. S. Bond, discussion leader

D. S. Auld, "Asteracus digestive proteinase."

J. S. Bond, "Meprin—a plasma membrane proteinase."

J. Kenny, "Membrane metallo-endopeptidases."

H. Nagase, "Matrix metalloproteinases."

Poster discussion: S. V. Pizzo, discussion leader

Metallo-proteinases II: J. S. Bond, discussion leader

B. H. Iglewski, "Pseudomonas elastase—biology and cloning."

A. G. Plaut, "IgA proteinases."

Chemistry and Biology of Pyrroles

Brewster Academy

S. I. Beale, chairperson; J. P. Kushner, vice chairperson

23-27 July

Molecular genetics of porphyria: G. H. Elder, discussion leader

J. Garey, "The spectrum of mutations in the uroporphyrinogen decarboxylase gene responsible for hepaterythropoietic porphyria and porphyria cutanea tarda."

P.-H. Romeo, "Elements involved in the erythroid expression of the human porphobilinogen deaminase gene."

R. J. Desnick, "Molecular genetics of uroporphyrinogen III synthase and congenital erythropoietic porphyria."

Pigment-protein interactions: G. N. LaMar, discussion leader

J. H. Dawson, "Structure-function relationship in heme-containing oxygenases and peroxidases."

G. T. Babcock, "Intermediates in heme-protein catalysis by cyto-

chrome oxidase."

J. P. Allen, "The structure and function of photosynthetic reaction centers."

Microbial and plant pyrroles: C. S. Russell, discussion leader

Y. J. Avissar, "Biosynthesis of δ -aminolevulinic acid in bacteria."

M. Matringe, "Protoporphyrin oxidase inhibition by diphenylether-type herbicides."

C. J. Walker, "Recent advances in the early steps of the Mg branch of chlorophyll synthesis."

Porphyrin chemistry: D. Dolphin, discussion leader

R. Bonnett, "Porphyrins and hydro-porphyrins as tumor photosensitizers: Recent advances."

J. L. Sessler, "Synthesis, properties, and biomedical applications of 'expanded porphyrins'."

R. Weiss, "Generation and characterization of high-valent iron porphyrin analogues of compounds I and II of horseradish peroxidase."

Enzyme regulation: H. A. Dailey, discussion leader

M. Yamamoto, "Tissue-specific expression of two genes for ALA synthase."

R. Labbe-Bois, "Molecular genetics of ferrochelatase and of uroporphyrinogen decarboxylase deficiency in the yeast *Saccharomyces cerevisiae*."

S. Shibahara, "Induction of human heme oxygenase by stress: Its molecular mechanisms and physiological implications."

Linear oligopyrroles: D. A. Lightner, discussion leader

P. M. Jordan, "The dipyrrole cofactor of PBG deaminase."

A. N. Glazer, "Phycobiliproteins: Bilin attachment and other post-translational modifications."

H. Falk, "Why 2,3-dihydrobilitindiones?"

Regulatory functions of heme and iron: R. F. Troxler, discussion leader

G. Padmanaban, "Heme as a regulator of cytochrome P-450 gene transcription."

W. Neupert, "Mechanism and role of heme addition during biogenesis of cytochromes c and c_1 ."

J. Harford, "Post-transcriptional regulation by iron of transferrin receptor and ferritin genes."

S. Schwartz, "Tricks and treats: Intriguing goals for pyrroles."

Therapeutic roles for pyrroles: poster session: J. Bloomer, discussion leader

New topics in pyrrole chemistry and biology: K. M. Smith, discussion leader

H. Ogoshi, "Molecular recognition in metalloporphyrins."

F.-P. Montforts, "Bonellin, heme d_1 , and related hydrophyrins: Structure, synthesis and function."

K. L. Rinehart, "Tuniclorin, the nickel-containing chlorin isolated from tunicates."

For information on poster sessions: Dr. James P. Kushner, Division of Hematology and Oncology, University of Utah College of Medicine, 50 North Medical Drive, Salt Lake City, UT 84132.

Quinoproteins and Pyrroloquinoline Quinone (PQQ)

Proctor Academy

P. M. Gallop, chairperson; H. M. Kagan, vice chairperson

2-6 July

Introductory remarks, H. Forrest, discussion leader

H. Duine, "Quinoproteins: An overview."

M. Ameyama, "Catalytic properties of quinoproteins in aerobic respiration."

H. Gorisch, "PQQ analysis by holo-enzyme reconstitution."

H. Kagan, discussion leader

M. Paz, "Redox cycling and quinoprotein detection."

W. MacIntyre, "PQQ sites and reactions in quinoproteins."

R. Fluckiger, discussion leader

D. Dooley, "Enzymes containing covalently bound quinones."

H. Kagan, "Lysyl oxidase."

J. Klinman, "Plasma amine oxidase."

J. Klinman, discussion leader

J. Villafranca, "Dopamine- β -hydroxylase."

R. Van der Meer, "Mammalian quinoproteins."

S. Seifter, discussion leader

R. Rucker, "PQQ, a mammalian vitamin."

A. Watanabe, "PQQ as a pharmacological agent."

H. Nishigori, "Perventative effects of PQQ on glucocorticoid-induced cataracts."

A. Meister, discussion leader

P. Gallop, "PQQ and oxidative stress in disease, alcohol abuse and aging."

J. McCord, "Superoxide and myocardial reperfusion injury."

A. Watanabe, discussion leader

Y. Ohshiro, "Biomimetics and chemistry of PQQ."

C. Levene, "Lysyl oxidase cofactor."

K. Soda, "Nitroalkane oxidase."

E. Snell, discussion leader

T. Bruice, "Chemistry of pyrroloquinolines related to PQQ."

J. Jongejan, "Aspects of quinoprotein structure."

D. Dooley, discussion leader

V. Davidson, "Bioenergetics of quinoproteins."

H. Frank, "Microbial quinoproteins."

K. Matsushita, "Growth stimulating activity of PQQ for microorganisms."

Radiation Chemistry

Salve Regina College

A. D. Trifunac, chairperson; C. L. Braun, vice chairperson

9-13 July

H. A. Schwarz, discussion leader

K. B. Eisenthal, "Femtosecond laser studies of electron solvation and recombination in liquids."

P. F. Barbara, "Ultrafast studies of charge transfer dynamics in water."

C. B. Harris, "Femtosecond studies

of chemical reactions in liquids."

J. Jortner, discussion leader

U. Landman, "Dynamics and spectroscopy of electron localization, excitation and transport in clusters, bulk media and interfaces."

M. A. Johnson, "Absorption spectra in the excess electron trapped on water clusters."

C. D. Jonah, discussion leader

T. R. Tuttle, "Solvated electron: What is solvated?"

G. W. Robinson, "The hydrated electron is *not* a solvated electron."

P. J. Rossky, "Quantum molecular dynamics of the hydrated electron."

N. V. Klassen, discussion leader

F. T. Williams, "Ion molecule reactions and rearrangements in freon matrices."

D. W. Werst, "Radical cation transformations in condensed phase radiolysis. The fate of the solvent holes."

Y. N. Molin, discussion leader

Y. Tabata, "Primary processes of radiation effect on hydrocarbon polymers."

R. Mehnert, "Spectral and kinetic characteristics of alkane radical cations."

N. Mataga, "Ultrafast laser photolysis studies on the dynamics and mechanisms of electron photoejection and recombination in solutions."

R. Schiller, discussion leader

O. A. Anisimov, "Coherent phenomena in radical-ion pair recombination."

R. W. Fessenden, "Spin dynamics of hydrogen atoms in water."

W. A. Bernhard, discussion leader

M. C. R. Symons, "Modification to DNA radiation damage induced by a range of additives."

S. Steenken, "Proton transfer coupled electron transfer processes in nucleic acid bases: Consequences for DNA radiation chemistry."

A. J. Swallow, "Problems with food irradiation: The role of radiation chemistry."

C. L. Braun, discussion leader

Poster session.

O. Micic, discussion leader

J. Belloni, "Nucleation dynamics of metal aggregates: Application to photographic development."

Y. Wang, "Optical and photophysical properties of semiconductor colloids: The effects of quantum confinement and dielectric confinement."

Radical Ions

Brewster Academy

G. L. Closs, chairperson; P. H. Rieger, vice chairperson

25-29 June

H. Roth, discussion leader

J. Dinnocenzo, "Cationic radical explorations."

D. Griller, "Redox properties of free radicals, applications to synthesis."

P. Dowd, "On the mechanism of vitamin B₁₂ action."

A. Pross, discussion leader

W. Borden, "Effects of radical pyramidalization on the strength of π -

bonds."

J. Fajer, "Conformational control and consequences of electron transfer in porphyrins."

M. Thurnauer, discussion leader

G. Brudvig, "Electron transfer on the donor side of photosystem II."

D. Holton, "Electron transfer in photosynthetic reaction centers and model systems."

I. Gould, "Contact and solvent separated ion pairs in electron transfer photochemistry."

B. Warren, discussion leader

W. Lubitz, "Electronic structure of primary reactants in photosynthetic reaction centers studies by EPR and ENDOR spectroscopy."

H. Levanon, "CW and pulsed EPR in photoelectron transfer reactions employing novel porphyrinoids."

M. A. Fox, discussion leader

P. Krusic, "Electron spin resonance studies of radical intermediates in organometallic chemistry."

N. Connelly, "Organometallic radicals via single electron transfer reactions."

W. Trogler, "Electrochemical studies of reaction mechanisms of organometallic radicals."

G. Russell, discussion leader

Y. Molin, "Low-temperature optical detected EPR spectra of radical ion pairs."

K. Salikhov, "Nonstationary kinetics of homogeneous recombination of radical ions."

L. Kispert, discussion leader

G. Kothe, "Transient EPR of spin polarized triplet states and radical ion pairs in viscous liquid crystals."

A. Howard, "EPR studies of aluminum atom reactions in a rotating cryostat."

D. Meisel, "Radical reactions with semiconductor particles."

P. Rieger, discussion leader

O. A. Anisimov, "Quantum beats in radical ion pair recombinations."

L. Tolbert, discussion leader

B. Ellison, "Spectroscopy of nitrene radical ions."

J. Grabowsky, "The reaction chemistry of radical ions in the gas phase."

P. Kebarle, "Electron affinities from electron transfer equilibria in gas phase and solvation energies of radical anions."

Reproductive Tract Biology

Brewster Academy

J. H. Clark, chairperson; P. Donahoe, vice chairperson

9-13 July

T. Ogle, discussion leader

R. Simmen, "Molecular biology of uteroferrin."

F. Bazer, "Uteroferrin: A hematopoietic growth factor."

C. Ting, "Translational regulation of lactoferrin gene expression."

F. French, discussion leader

E. Wilson, "Molecular biology of the androgen receptor."

T. Brown, "Molecular biology of an-

drogen insensitivity syndrome."

J. Pollard, discussion leader

J. McLachlan, "Estrogen and growth factors in uterine growth and development."

G. Stancel, "Role of growth factors and nuclear oncogenes in estrogen action."

D. MacLaughlin, "Transacting factors regulation Mullerian inhibiting substance."

D. Schomberg, discussion leader

J. Richards, "The ovary: An upstream promoter."

D. Segaloff, "Cloning and expression of the LH receptor."

B. Markaverich, discussion leader

W. Okulicz, "Steroid receptor regulation in the primate uterus."

K. Korach, "Uterine estrogen stimulation: The role of multiple estrogen receptor interactions."

C. Wira, "Sex hormone and antigen regulation of secretory component and IGA in the female genital tract."

D. Obrian, discussion leader

D. Dunbar, "Structure and expression of complementary DNAs for zona pellucida."

M. O'Rand, "Sperm proteins involved in binding to the zona pellucida."

J. Herr, "A differentiation antigen of human spermatogenesis."

M. Ascoli, discussion leader

G. Slaughter, "Cell-specific expression of genes that transduce calcium effects during spermatogenesis."

N. Hecht, "Gene expression during spermatogenesis."

H. Dickerman, discussion leader

K. Henrikson, "Prothrombin and tissue factor in the development of the uterus."

B. Pentecost, "Hormonal regulation of creatine kinase-B."

L. Gerschenson, discussion leader

S. Glasser, "Apical and basal plasma membrane domains of polarized uterine epithelial cells respond differently to steroid hormone regulation."

M. Tenniswood, "Androgen-regulated genes."

Second Messengers and Protein Phosphorylation

Kimball Union Academy

J. Maller, chairperson; R. Reed, vice chairperson

11-15 June

J. Maller, discussion leader

R. Erikson, "Regulation of mitogen-activated serine-specific protein kinases."

J. Avruch, "Insulin-regulated S6 kinases in liver."

G. Thomas, "Molecular and cellular characterization of mitogen-activated S6 kinase."

T. Hunter, discussion leader

L. Williams, "Substrates of the PDGF receptor and FGF receptor tyrosine kinases."

L. Cantley, "Growth factor signal transduction mechanisms."

H. Hanafusa, "Interaction of the *crk* gene product with cellular proteins."

E. Fischer, discussion leader

I. Trowbridge, "CD45: A lymphocyte tyrosine phosphatase."

E. Krebs, "Use of tyrosine phosphatases to study mitogen activation of ser/thr kinases."

D. Brautigan, "Cell cycle oscillations of phosphatase inhibitor-2."

A. Depaoli-Roach, "Expression of phosphatase inhibitor-2."

P. Roach, discussion leader

B. Kemp, "Pseudosubstrates and substrate recognition by protein kinases."

M. Zoller, "Identification of functional domains in yeast A-kinase."

S. Taylor, "Structural analysis of cAMP-dependent kinase."

J. Maller, discussion leader

K. Gould, "Cell cycle regulation of the *cdc 2* protein kinase."

G. Draetta, "*cdc 2* kinase in mammalian cells."

G. Vande Woude, "*mos* proto-oncogene function."

J. Wang, "*cdd 2*-dependent phosphorylation of oncogenes and anti-oncogenes."

J. B. Gibbs, discussion leader

F. McCormick, "Role of *Ras* and *GAP* in signal transduction by tyrosine kinases."

R. Reed, "Molecular components of olfactory signal transduction."

M. Gill, "Role of *Rho* proteins in actin polymerization."

D. Granner, discussion leader

M. Montminy, "CREB transcription factors."

B. Eisenmann, "Phosphorylation and regulation of nuclear oncoproteins."

J. Dixon, "Transcriptional regulation by cAMP."

E. G. Krebs, discussion leader

P. Cohen, "The future of protein phosphorylation research in the last decade of the 20th century."

J. Beavo, discussion leader

R. Davis, "Molecular characterization of insect and mammalian PDEs."

R. Weishaar, "PDEs regulating myocardial contractility and ANP actions."

M. Conti, "Structure and regulation of cAMP PDEs."

Separation and Purification

Colby-Sawyer College (N)

T. A. Hatton, chairperson; J. Sherman, vice chairperson

13-17 August

C. Lowe, "New developments in affinity separations."

R. Carbonell, "Protein separations using affinity surfactants."

W. Hinze, "Organized molecular assemblies in chemical separation."

J. Fulton, "Reverse micelles and microemulsions in near-critical and supercritical fluids."

M. Doherty, "Principles of reactive distillation."

V. Agreda, "High-purity methyl acetate via reactive distillation."

G. Hubred, "Centrifugal distillation."

J. Solomon, "High-purity gases for

electronics applications."

V. McGuffin, "Predictive elution strategies for HPLC."

R. Sachs, "Strategies for high-speed gas chromatography."

P. Carr, "Linear solvation energy relationships: Solvatochromism and chromatography."

K. Lipkowitz, "Computational analysis of chiral recognition in chromatography."

J. Rebek, "Studies in molecular recognition."

P. Rolceggio, "Vortex flow filtration."

K. Sirkar, "Hollow fiber contained liquid membranes for environmental pollution control."

Solid-State Chemistry

Plymouth State College

A. J. Jacobson, chairperson; F. DiSalvo, vice chairperson

23-27 July

Transition metal chalcogenides and pnictides: L. Schneemeyer, discussion leader

J. Rouxel, "Chemical reactivity of low-dimensional solids"

B. A. Parkinson, "Imaging and modification of the surfaces of 2-D metal chalcogenides with the scanning tunneling microscope."

F. Franzen, "High-temperature x-ray diffraction investigation of structure and phase transitions."

Transition metal chalcogenides and pnictides: J. Corbett, discussion leader

H. Fjellvag, "Magnetic and structural properties of 3-D metal substitutes MnP and MnAs."

Molecules to solids: J. Johnson, discussion leader

M. Steigerwald, "Molecular routes to solid-state materials."

C. J. Brinker, "Microstructural tailoring via sol-gel routes."

P. Batail, "Chemistry structural design and electronic properties of organic-inorganic molecular solids."

Thin-film chemistry: L. Interrante, discussion leader

G. Girolami, "Organometallic chemical vapor deposition"

A. Bocarsly, "Electrochemistry as a probe of the solid state: The chemistry of ultrathin metal cyanometallate films."

Superconductivity in oxides: A. Sleight: discussion leader

B. Raveau, "Relationships between structure, chemical bonding and superconductivity in copper oxides."

D. Hinks, "The nature of defects and doping mechanisms in oxide superconductors."

M. Alario-Francoc, "Electron diffraction of some high-temperature superconducting materials."

Superconductivity in oxides: F. DiSalvo, discussion leader

M. Greenblatt, "Chemistry and superconductivity of thallium-based cuprates."

Oxides: Structure and properties: J. Goodenough, discussion leader

M. Jansen, "Silver oxides which show structural and electronic fea-

tures of superconductors but are not superconducting."

J. Greedan, "Frustrated oxide magnets."

G. Stucky, "Optical properties of oxides."

Oxides—catalysis and catalytic materials: N. Bartlett, discussion leader

J. Thomas, "The role of solid-state chemistry in the design of heterogeneous catalysts."

Oxides—catalysis and catalytic materials: T. Cheetham, discussion leader

K. Poeppelmeier, "New chemistry for the generation of high surface area oxides."

M. Anpo, "Photocatalysis and photo-induced reactions on supported oxides."

J. Newsam, "Something about zeolites."

Solid-State Ionics

Colby-Sawyer College (S)

M. Ratner, chairperson; S. Whittingham, vice chairperson

18-22 June

J. Souquet, "Ionic transport in glasses."

W. Risen, "Ions in sol-gel-prepared amorphous materials."

M. Greenblatt, "Novel materials for sensor applications."

R. Catlow, "Recent developments in the modeling of ionic materials."

K. Funke, "Jump relaxation in solid electrolytes."

M. Armand, "Recent advances in polymer electrolytes."

D. F. Shriver, "Polymer electrolytes and charge transport."

H. zur Loye, R. Granek, "Iodide electrolytes/theoretical approaches to polymer electrolytes."

F. Wudl, "Polyelectrolytes with conjugated backbones."

J. Saveant, "Charge propagation in redox polymers."

K. Kishio, "Oxygen nonstoichiometry and oxygen sensitive properties of high T_c oxide superconductors."

R. Dieckmann, "Point defects, transport of matter and charge in oxides and the kinetics of solid-state reaction."

E. Cotts, "Interdiffusive formation of metastable materials."

A. Jacobson, "Oxidative coupling of methane on mixed oxide catalysts."

B. Dunn, "Optical properties of aluminas."

T. Haas, "Electrochromic materials."

D. Corrigan, "Electrochemical properties of mixed conductors."

M. Wakihara, "Lithium secondary batteries using chevron phase sulfides as the cathode and sulfur gas sensor."

R. Eisenberg, "Ion transport in biological channels."

Statistics in Chemistry and Chemical Engineering

New Hampton School

J. F. MacGregor, chairperson; W.

Q. Meeker, vice chairperson

30 July–3 August

S. Wold, N. Kettaneh-Wold, "Multivariate design and analysis."

T. Naes, discussant

J. S. Hunter, moderator

R. Swanson, "Multivariable process and quality control."

T. J. Harris, discussant

G. J. Hahn, moderator

G. E. P. Box, I. Hau, S. Jones, "Recent developments in design: Constrained designs and robust designs."

J. Cornell, moderator/discussant

T. J. McAvoy, "Neural networks and their applications."

J. F. MacGregor, discussant

R. DeVeaux, moderator

G. Blau, K. Kuenker, "Sensitivity analysis in modeling chemical plants for design and optimization."

D. W. Bacon, discussant

W. J. Hill, moderator

J. Wu, "Planning fractional factorial experiments to accommodate specific interactions."

R. Kacker, discussant

K. Hockman, moderator

B. Kowalski, "Multivariate and tensorial calibration."

S. Brown, discussant

R. Easterling, moderator

P. M. Reilly, "A discrete Bayesian method for parameter estimation."

V. Nair, moderator

D. Pregibon, "Interactive statistical graphics."

W. DuMouchel, discussant

L. Hare, moderator

To submit posters, contact: Dr. W. Q. Meeker, Department of Statistics, Iowa State University, Ames, IA 50010.

Stereochemistry

Salve Regina College

J. A. Marshall, chairperson; D. Sternbach, vice chairperson

2–6 July

M. Midland, discussion leader: K. Gilbert, K. Steliou

E. Eliel, discussion leader: P. Deslongchamps, A. Myers

The following will also speak: F. Die-drich, W. Oppolzer, S. Masamune, K. Mori, M. Rosenblum, J. Faller, R. Bloch, K. Mikami, S. Martin, A. Barrett, M. Krafft, G. Molander, I. Lantos.

Synthetic Membranes

Plymouth State College (S)

W. J. Ward, chairperson; J. Anderson, vice chairperson

9–13 July

P. Meares, discussion leader

J. L. Duda, "Diffusion and sorption in polymers—a free volume point of view."

U. Suter, "Diffusion of gases through glassy polymers—an atomistic model."

A. Jones, "The dynamics of gases and liquids sorbed in polymers by NMR spectroscopy."

J. Anderson, discussion leader

T. Lodge, "Diffusion of linear and star molecules through entangled matrices."

F. Lanni, "Diffusion of macromolecules through actin gels."

W. Eykamp, discussion leader

J. Meldon, "Prospects for gas separation in solid microporous films."

D. Yavorsky, "Vortex flow filtration: Principles and practice in bioseparations."

A. Grodzinsky, "Electrically controlled dynamic gel membranes."

R. Ray, discussion leader

J. Schmidhauser, "Molecular design of new highly permeable polymers."

S. Auvel, "An extraordinary polymeric membrane that rejects light gases."

J. Quinn, discussion leader

K. Vanderlick, "Structure, phase behavior, and shape transitions of monolayers at the air/water interface."

A. Ulman, "Surface engineering: Wetting properties of mixed monolayers of alkane thiols on gold."

S. Garoff, "Wetting at inhomogeneous surfaces."

R. Baltus, discussion leader

W. Deen, "Recent developments in hydrodynamic models of hindered transport."

E. Glandt, "Partitioning and transport in model fibrous matrices."

A. Michaels, discussion leader

C. Colton, "Membranes in implantable immunosolation devices."

P. Aebischer, "Synthetic membranes as facilitators of neural regeneration."

S. Matson, "Membrane reactors: From fundamentals to process scale-up."

E. Mason, "From pig bladders and cracked jars to polysulfone: A historical perspective of membrane transport."

J. Henis, discussion leader

S. Margel, "Novel monodispersed reactive polymeric microspheres."

A. Zydney, "Protein adsorption, deposition, and transport during size selective ultrafiltration."

F. Halaka, "The separation of biologicals utilizing unique properties of membranes and electric fields."

Theoretical Biology and Biomathematics

Tilton School

S. E. Fraser, chairperson; J. P. Keener, vice chairperson

11–15 June

Developmental biology: G. Oster, chair

J. Murray, "Models for biological pattern formation."

G. Oster, "Morphogenesis in developing organisms by cell rearrangement."

G. Odell, "Pattern formation in the early *Drosophila* embryo: A testable model."

W. Brandts, J. Frankel, "Experiments and models of pattern formation in a unicellular organism: *Tetrahymena*."

Endocrinology:

J. Rinzel, "Synchronization of beta-cell oscillations and secretion."

A. Goldbetter, "Mechanisms of calcium oscillations and their role in secretion."

E. Knobel, "The hypothalamic clock and the control of biological rhythms."

Hematology:

M. Mackey, "Nonlinear dynamics and the modeling of blood cell production."

A. Fogelson, "Platelet aggregation."

Neurobiology: J. Bower, chair

C. Grasky, "Experiments and models of the organization of somatosensory cortex."

C. Gray, "Experimental analysis of oscillatory responses in the neocortex."

M. Wilson, "A structural model for information flow in the olfactory cortex."

Neurobiology:

A. Cohen, "Experimental studies of spinal motor control circuits."

B. Ermentrout, "A model for the control of motor pattern generators."

Molecular and cell biology: S. Fraser, chair

Z. Agur, "Improving antiviral chemotherapy: Mathematical models and their experimental verification."

J. Tyson, "Gene regulation in parvovirus."

J. Mahaffy, "Cell replication in a simple system: *E. coli*."

Ecology: P. Kareiva, chair

P. Kareiva, "Dispersal of insect populations."

B. Shaeffer, "A nonlinear dynamics approach to population modeling."

Transport and locomotion: J. Keener, chair

M. Reed, "Axonal transport."

S. Vogel, "Life in moving fluids."

H. Crenshaw, "Helical locomotion in microorganisms."

L. Fauci, "Swimming microorganisms."

Thermosetting Polymers

Colby-Sawyer College (S)

H. E. Bair, chairperson; J. E. McGrath, vice chairperson

25–29 June

B. M. Culbertson, discussion leader

J. V. Crivello, "A new light on thermosets-photoinduced cationic polymerization."

J. H. Lupinski, "Novel encapsulating epoxy system."

A. Hale, discussion leader

S. L. Cooper, "UV-curable polyurethane acrylates."

G. L. Batch, "Thermocharacterizations and modeling of curing kinetics of crosslinking free radical polymerizations."

J. Gillham, discussion leader

M. Boyce, "Modeling elastic-viscoplastic deformations of polymers."

D. Adolf, "Viscoelasticity near the sol-gel transition."

L. Manzione, "Flow behavior of molding compounds in plastic packaging of microelectronic devices."

A. Yee, discussion leader

J. L. Sullivan, "Creep and physical aging of composites."

A. Hiltner, "Failure and fracture of thermoset composites."

R. Lagasse, discussion leader

J. G. Williams, "Evidence for a soft interface in organic matrix composites."

M. A. Vallance, "A direct reading toughness test for assessment of thermal and rate effects in delamination of advanced composites."

E. F. Oleinik, "Deformation of networks."

K. C. Dewhurst, discussion leader

J. E. McGrath, "Thermoplastic-modified thermosets."

J. E. Moore, "Polyenaminonitriles and related materials."

K. Dusek, discussion leader

N. Kinjo, "Structure-property relationships of epoxy resins."

R. Williams, "Fundamental aspects relating to curing of thermosetting polymers."

H. E. Bair, discussion leader

L. L. Blyler, Jr., Overview of optical fiber technology: Applications for thermosetting polymers."

J. E. McGrath, discussion leader

L. W. Kessler, "Application of acoustical imaging for characterization of bonding in thermoset materials."

K. M. Takahashi, "Degradation of epoxy coatings in humid environments."

Tribology

Holderness School

H. S. Cheng, chairperson; F. Kennedy, vice chairperson

Frontiers of Microscopic Tribology

25–29 June

J. Israelachvili, discussion leader

P. McGuiggen, "Liquid to solid transitions of molecularly thin films under shear."

S. Granick, "Friction studies using atomically smooth surfaces."

J. M. Georges, "Shear properties of calcium carbonate nano-film."

B. Goddard, discussion leader

U. Landman, "Microdynamics and micromechanics of adhesive contacts and tribological phenomena."

B. Soriano, "Tribo-behavior of single crystal CaF_2 and BaF_2 sliding against themselves."

E. Klaus, discussion leader

H. Spikes, "In lubro: The behavior of lubricant molecules in contacts."

P. Stair, "What does ZDP do on metal surfaces?"

D. Coy, "Modeling of lubricant molecules under pressure and shear."

D. Dowson, discussion leader

A. Lubrecht, "Mathematical modeling of lubrication."

B. Hamrock, "Film collapsing in micro-elastohydro dynamic lubrication."

Y. Kimura, "Modeling of EHL with emulsions."
 W. Winer, discussion leader
 S. Ramalingam, "Tribo-behavior of samples coated with ceramic films."
 M. Gardos, "Tribo-behavior of polycrystalline diamond films."
 K. Miyoshi, "Tribology of plasma-deposited amorphous hydrogenated carbon films on silicon nitride."
 B. McConnell, discussion leader
 I. Singer, "Applications of thermochemistry in tribology."
 B. Tatarchuk, "Surface chemistry of buried-solid interface: Chemical and tribological interactions."
 F. Kennedy, discussion leader
 K. Johnson, "Shakedown of sliding rough surface."
 G. Hahn, "Elastic-plastic analyses of repeated rolling and sliding contacts."
 F. Ju, "Mechanics of tribo-coatings."
 L. M. Keer, "Failure mechanisms in coatings."
 H. S. Cheng, discussion leader
 J. Rice, "Tribological phenomena in earthquakes."
 M. Godet, discussion leader
 K. Kato, "Micro-wear mechanisms and wear map."
 S. Hsu, "Asperity wear modeling."
 L. Ives, M. B. Peterson, "Mechanism of galling wear."

Vascular Cell Biology

Kimball Union Academy

B. Duling and J. S. Pober, co-chairpersons

30 July-3 August

Vasculogenesis and angiogenesis: W. Risau, discussion leader
 D. Noden, "Endothelial migration in vascular development."
 D. Rifkin, "FGF and angiogenesis."
 P. D'Amore, "Balance between TGF-beta and FGF."
 Differentiation, growth and metaplasia of vascular smooth muscle: P. Libby, discussion leader
 C. Emerson, "Molecular differentiation of muscle."
 G. Owens, "SMC growth."
 S. Schwartz, "SMC metaplasia."
 Cell-matrix interactions: J. Madri, discussion leader
 E. Dejana, "Endothelial cell matrix receptors."
 R. Montesano, "Matrix and in vitro angiogenesis."
 D. Ingber, "Matrix and growth control."
 Tumor vasculature: R. Auerbach, discussion leader
 H. Dvorak, "Architecture of tumor vasculature."
 D. Stern, "Tumor modulation of endothelium."
 D. Hanahan, "Induction of tumor vessels."
 Vascular cell signaling: M. Peach, discussion leader
 P. Davies, "Flow sensing mechanisms in vascular cells."
 T. Hallam, "Frequency and amplified

of Ca^{++} changes."

E. Neer, "G proteins in vascular cells."

Communication among vascular cells: P. Vanhoutte, discussion leader
 S. Moncada, "Nitric oxide as an intercellular signal."

T. Masaki, "Endothelin."

J.-L. Beny, "Electrical communication between vascular cells."

Cellular basis of vascular permeability: C. Michel, discussion leader

F. R. Curry, "Intracellular Ca^{++} and permeability in vivo."

D. Lagunoff, "Endothelial cell contractile proteins."

S. Silverstein, "Environmental influence on permeability."

The high endothelial venule: S. Rosen, discussion leader

E. Butcher, "Homing receptors and addressins."

M. Gallatin, "Molecular bases of homing."

T. Issekutz, "Homing of lymphocytes in inflammation."

Immune-mediated perturbation of endothelial function: J. Pearson, discussion leader

R. Cotran, "Antibodies in vascular disease."

J. Cerilli, "Endothelial-monocyte antibodies."

P. Sims, "Complement-mediated endothelial stimulation."

Vibrational Spectroscopy

Brewster Academy

J. F. Rabolt, chairperson; T. A. Keiderling, vice chairperson

6-10 August

Molecular dynamics:
 T. Gustafson, "Solvent/solute interactions probed by picosecond transient Raman spectroscopy."
 Surfaces and interfaces:
 N. Ferris, "Surface-enhanced Raman spectroscopy of thin molecular assemblies."
 Biological applications:
 I. W. Levin, "Molecular reorganizations in biological membranes: FT and dispersive Raman and infrared spectroscopic studies."
 Novel spectroscopic techniques:
 D. Saperstein, "Nitrogen doping of amorphous carbon: Laboratory and interstellar observation of the Raman active G and D bands in the infrared."
 Other topics to be included: vibrational intensities, high-resolution spectroscopy, and theoretical spectroscopic methods.

Chemistry and Physics of Water and Aqueous Solutions

Holderness School

P. Rossky, chairperson; J. Enderby, vice chairperson

30 July-3 August

C. L. Brooks, III, discussion leader
 R. Wolfenden, "Solvent participation in enzymatic activity."

D. S. C. Yang, "Structure and function of antifreeze proteins."

M. Levitt, "Stimulation of proteins in solution."

B. M. Pettitt, discussion leader

M. T. Record, "Ionic distributions in polynucleotide solutions."

B. Honig, "Electrostatic contributions to reaction dynamics and conformation."

M. Newton, discussion leader

M. Weaver, "Solvent dynamics in electron transfer."

D. Chandler, "Microscopic theory of electron transfer dynamics."

P. Barbara, "Ultrafast studies on solvation dynamics and electron transfer."

M. L. Klein, discussion leader

M. Sprik, "Polarizable models for aqueous interactions."

W. A. P. Luck, "Spectroscopic measurements of hydrogen bond cooperativity."

J. Simon, discussion leader

K. Eisenberg, "Ionization, electron solvation, and geminate recombination."

C. Jonah, "Electron reactions in irradiated media."

U. Landmann, "Simulation of electrons in molecular clusters."

L. Pratt, discussion leader

P. Thiel, "Water adsorption on metallic surfaces."

M. Berkowitz, "Water structure and dynamics at metallic surfaces."

H. White, discussion leader

V. A. Parsegian, "Hydration forces in lamellar and DNA assemblies."

R. Kjellander, "Theory of interfacial forces in ionic solutions."

H. Christenson, "Force balance measurements of interfacial forces."

H. Friedman, discussion leader

F. Millero, "Chemistry in natural waters."

J. Enderby, discussion leader

S.-H. Chen, "Ionic distributions in polyelectrolyte systems."

K. Dawson, "Theory of amphiphilic assemblies."

J. Penfold, "Structure of adsorbed surfactant layers."

Physical-Chemical Aspects of Water, Solute, and Cell Exchange in the Microvasculature

Plymouth State College (S)

D. Shepro, chairperson; F. Curry, vice chairperson

11-15 June

The cell biology of the microvascular wall: I. Herman and F. Vargas, chairmen; A. Orlidge, discussion leader
 D. Walker, "The tricellular region on endothelial tight junctions and the pathway of PMN emigration."
 A. Gotlieb, "The structure-function of the F-actin cytoskeleton."
 S. Albelda, "Endothelial cell-cell and cell-substratum adhesion receptors."
 Transport and the blood brain barrier: R. Gore and B. Duling, chairmen; R. Tilton, discussion leader
 T. Raub, "Induction of the blood-brain

barrier phenotype in cultured endothelia by astroglia."

R. Broadwell, "Pathways into, through and around the blood-brain barrier: Interpreting transcytosis."

Endothelial posttranslational metabolic regulation of transport: U. Ryan and D. N. Granger, chairmen; W. Patton, discussion leader

M. E. Gerritsen, "P2-puriner receptor-coupled signal transduction in microvascular endothelial cells."

A. B. Malik, "Regulation of endothelial barrier function by second messengers."

S.-P. Olesen, "Patch-clamp analysis of endothelial ion channels."

Vascular cell communication: H. Granger and R. Prewitt, chairmen; P. Davies, discussion leader

A. Dodge, "Microvascular endothelial cell and pericyte interactions related to motility."

D. M. Shasby, "Communication between the neutrophil and endothelium."

Modulation of transcapillary fluid transport: I. Sarelius and A. Taylor, chairmen; V. Tucker, discussion leader

M. Johnston, "Lymphatic pumping response to changes in transmural pressure and its modulation by erythrolyse and hemoglobin."

V. Huxley, "Influence of hormones on the dynamic regulation of microvascular exchange: Results from in situ perfused capillaries."

P. Vaupel, "Bulk flow of water in the interstitium of human tumor xenografts."

Fluorescent imaging of microvessels: A. Kamiya and K. Spring, chairmen; M. Oda, discussion leader

F. Fay, "Changes in ion and protein distribution underlying smooth muscle cell function."

F. Curry, "Calcium modulation of permeability in intact microvessels."

Pathology of microvascular diseases: J. Bassingthwaite and E. Renkin, chairmen; E. Svensjo, discussion leader

J. E. Brush, Jr., "Microvascular angina in hypertensive patients."

H. B. Hechtman, "Inflammatory mediator of remote organ injury."

P. Vanhoutte, "Endothelium-derived vasoactive factors."

Poster session: F. Curry, chairman

Tumor microvasculature: Metastases, detection, treatment: P. Gullino and M. Intaglietta, chairmen; L. Weiss, discussion leader

B. Zetter, "Chemotactic peptides that modulate tumor metastases."

D. Connolly, "Tumor vascular permeability factor."

R. Jain, "Transport of macromolecules and cells in tumor microcirculation."

Zeolitic and Layered Materials

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S. L. Suib, chairperson; M. Davis, vice chairperson

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Synthesis of novel zeolitic and lay-

ered materials:

M. Davis, "Some thoughts on synthesis of large pore zeolites."

A. Clearfield, "The chemistry of layered inorganic/organic complexes."

T. J. Pinnavaia, "Designing pillared clays and related lamellar structures for advanced materials application."

In situ probes of synthesis and nucleation:

P. K. Dutta, "Spectroscopy studies of zeolite nucleation and synthesis."

J. White, "Silicate gel modification by template molecules."

Semiconductor and nonlinear optical materials:

G. D. Stucky, "Orientation and packaging of molecular anatomic clusters for materials application."

Y. Wang, "Linear and nonlinear optical properties of semiconductor clusters in zeolites and polymers."

G. A. Ozin, "Turning molecular sieves into molecular devices; intra-zeolite quantum electronic and nonlinear optical nanostructures."

Clays and layered materials:

J. J. Fripiat, to be announced.

H. Van Damme, "Static and dynamics constraints on adsorption and diffusion in pillared layered structures."

Control of surface and catalytic prop-

erties of aluminosilicates:

T. L. Barr, "XPS studies of controlled alterations of zeolites and related materials."

J. C. Vedrine, "Isomorphous substitution in ZSM-5 type zeolites and their influence in acidic and catalytic properties."

R. Von Ballmoos, "Fluid cracking catalysis."

Photochemical and electrochemical studies of zeolite and layered systems:

J. K. Thomas, "Photochemical reactions in zeolites."

B. R. Shaw, " 'Gas-phase' electroca-

talysis in dry molecular sieves."

A. J. Bard, "Clay modified electrodes."

T. E. Mallouk, "Light-driven electron transfer reactions in zeolites and clays."

T. Bein, "Towards molecular wires: Conjugated polymers in zeolites."

New materials and characterization methods:

J. M. Thomas, "In situ characterization of zeolite catalysts by x-ray methods."

R. C. Haushalter, "Synthesis and structure of reduced molybdenum phosphate frameworks."

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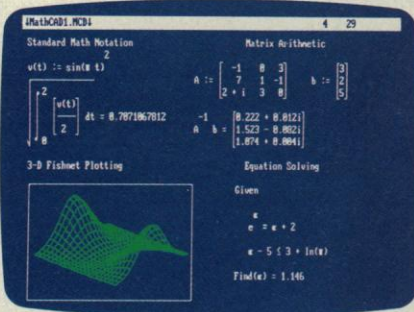
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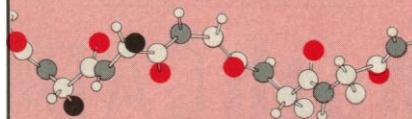
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