

Twenty-Ninth Annual Briefing NEW HORIZONS IN SCIENCE

*November 3 through 7, 1991
McCormick Center Hotel, Chicago*

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Science
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Sunday, November 3

6:30 p.m. to 9:00 p.m.

Registration and Welcome Reception
McCormick Center Hotel

Monday, November 4

8:30 a.m. to 11:30 a.m.

GENETIC LASERS

Robert B. Goldberg, Ph.D., Professor of Biology, University of California, Los Angeles

By introducing into plant species bacterially derived "killer" genes that are expressed in strict, tissue-specific fashion, researchers have succeeded in generating male-sterile lines. The technique promises to be a major boon to agriculture, providing as it does a dependable new way for producing hybrid seed in a host of important crops — tomato, rice and potato among them. And now, with the isolation of an "anti-killer" gene from the same bacterial strain, it becomes possible to restore fertility, enabling growers to perpetuate otherwise non-maintainable hybrid varieties.

THE CELL CYCLE

Marc W. Kirschner, Ph.D., Professor of Biochemistry and Biophysics, University of California School of Medicine, San Francisco

Biologists are finally getting a molecular handle on what it is that controls cell division. One surprising finding: the regulation of replication in all living organisms (other than bacteria and viruses) seems largely dependent on the activation of one specific protein. This and other discoveries are expected to lead, on the one hand, to strategies for fighting cancer and cardiovascular disease (both characterized by unregulated cell reproduction) and, on the other, to ways of inducing proliferation of new cells needed to repair damaged tissue.

Monday, November 4
2:30 p.m. to 5:30 p.m.

DEFENSINS: THE BODY'S IN-HOUSE ANTIBIOTICS

Michael E. Selsted, M.D., Ph.D., Associate Professor of Pathology and Microbiology and Molecular Genetics, University of California School of Medicine, Irvine

Initially thought to be manufactured solely by certain immune cells, a recently discovered family of highly potent microbe-killing agents called defensins have now been found to be produced by other tissues as well. There is growing expectation that these molecules will provide the basis for development of novel antibiotics capable of wiping out a wide variety of disease-causing bacteria, fungi and some viruses. More fundamentally, defensins may help in efforts to unravel the mystery of protein folding.

LINEAR CARBON

Richard J. Lagow, Ph.D., Professor of Chemistry, University of Texas, Austin

Two decades ago, Russian scientists announced the discovery of a new form of carbon. Dubbed carbyne, it was said to consist of a long chain of carbon atoms joined end-to-end. The claim was eventually discounted and common chemical wisdom continued to prevail: natural carbon exists in just two elemental forms, diamond and graphite. But recent detection, and now abundant generation, of an exotic family of soccer ball- and egg-shaped molecules, called fullerenes, show carbon to be far more plastic than imagined, and that a relatively stable form of linear carbon may, in fact, be creatable — with many new applications to follow.

6:00 p.m.

Hospitality Suite open
Free evening

Tuesday, November 5

8:30 a.m. to 11:30 a.m.

EAT, DRINK AND . . . BE TOLERANT

Caroline C. Whitacre, Ph.D., Associate Professor of Medical Microbiology and Immunology, Ohio State University, Columbus

Recent studies in lab animals lend strong support to the idea that a variety of autoimmune disorders — e.g. rheumatoid arthritis, encephalitis, uveitis and multiple sclerosis — may be treatable simply through oral administration of the very proteins, the antigens, that trigger the abnormal immune reaction in the first place. Perhaps the most appealing feature of oral antigen therapy is its inordinate specificity: only that part of the immune machinery responsible for the double-cross is throttled, as contrasted with other, more conventional immunosuppressive remedies which act to dampen the entire defense system. Human trials are in progress.

THE GALILEE BOAT

Shelley Wachsmann, Ph.D., Meadows Assistant Professor of Biblical Archeology, Nautical Archaeology Program, Texas A&M University, College Station

The background of Jesus' ministry is the Sea of Galilee; his first followers were Jewish fishermen and sailors who plied its waters. Some four decades after Jesus' death in A.D. 67, Jews fought Romans in the Battle of Migdal, a bloody engagement some call a nautical Masada. In 1986, a 2000-year-old boat was discovered in the Sea of Galilee. Although not directly tied to either the Gospel stories or the Migdal battle, the boat, as a new scientific excavation report suggests, is typical of the vessels of the time and has much to tell about how those boats were built and used. In doing so, it opens an invaluable window on a region and period of pivotal import to Christian and Jewish tradition.

*Tuesday, November 5
2:30 p.m. to 5:30 p.m.*

**WORKSHOP FOR JOURNALISTS
HUMAN GENOME TECHNOLOGY:
SOCIAL, LEGAL AND ETHICAL CHALLENGES**

Moderator:

Albert Rosenfeld, CASW Board member, veteran science writer and consultant on bioethics

Panelists:

Leroy Hood, M.D., Ph.D., Bowles Professor of Biology and Director, Center for Molecular Biotechnology, California Institute of Technology, Pasadena

Neil A. Holtzman, M.D., Professor of Pediatrics, Johns Hopkins School of Medicine, Baltimore

Lori B. Andrews, J.D., Research Fellow, American Bar Foundation, and Senior Scholar, Center for Clinical Medical Ethics, University of Chicago

Thomas H. Murray, Ph.D., Professor and Director, Center for Biomedical Ethics, Case Western Reserve University School of Medicine, Cleveland

As knowledge about the makeup of the human genome continues to expand at a dizzying clip, so too, as a direct consequence, does the inventory of genetic tests that serve to predict an individual's predisposition to serious disease or early death. There's growing worry about the possible misuse of information generated by these tests — by insurers, government or would-be employers. In the future, writers filing on the latest genetic advances will more and more be obliged to report on the social, legal and ethical implications of these scientific developments. This workshop is intended to help you in that task.

6:30 p.m.

Buses begin departing for IIT's Hermann Hall, 40 West 33rd Street, approximately 10 minutes from the hotel.

7:00 p.m.

RECEPTION AND ANNUAL CASW BANQUET

Presentation of the 1991 National Association of Science Writers' Science-in-Society Journalism Awards

Featured Speaker: Leon M. Lederman, Ph.D., Frank L. Sulzberger Professor of Physics, University of Chicago

Wednesday, November 6 *8:15 a.m.*

Buses depart for the Illinois Institute of Technology campus.

9:00 a.m. to 12 Noon

A session devoted to an exploration of new, high-impact technologies now under development at IIT

SCIENCE IN THE WIND

Hassan Nagib, Ph.D., Professor and Chairman, Department of Mechanical and Aerospace Engineering

Construction of what is reputed to be the world's most sophisticated wind tunnel is nearing completion. It heralds a new era of research on aerodynamics that will have a major say in how we build tomorrow's vehicles of transportation and war.

MINIATURE IMPLANTABLES

Philip Troyk, Ph.D., Associate Professor of Electrical Engineering, Pritzker Institute of Medical Engineering

New technology for packaging and powering devices placed in the human body has opened the way to development of a new generation of ultra-tiny implantables — including, for example, an actuator for stimulating paralyzed muscle that can be injected by hypodermic needle.

AEROBICS AND PUMPING SODIUM: LEARNING FROM MICROBES

Dale A. Webster, Ph.D., Professor of Biology
Ben Stark, Ph.D., Associate Professor of Biology

Isolation of a hemoglobin gene from an unusual strain of bacteria has given rise to a new transgenic strategy that promises to enhance the productivity of recombinant-DNA technology. The same species also has researchers thinking about novel and inexpensive ways to desalinate sea water.

FRINGE TECHNOLOGY MADE PORTABLE

Cesar A. Sciammarella, Ph.D., Professor of Mechanical and Aerospace Engineering

A new variety of holography provides a sure, easy way to screen critical structures — airplanes, ships, buildings, bridges — for otherwise-undetectable signs of potentially calamitous stresses and strains. The system has now been made portable to allow for fast, on-site inspections.

Wednesday, November 6
12:30 p.m.

Lunch

1:30 p.m. to 4:00 p.m.

OPTIONAL TOURS TO THE CUTTING EDGE OF TECHNOLOGY

An opportunity to get an intimate look at: the wind tunnel built for the 21st Century; Project Phoenix, a unique experience in computer-based design; the railroad locomotive simulator; the Odor Sciences Center; IIT's advanced co-generation plant.

6:00 p.m.

EVENING AT THE ADLER PLANETARIUM

Reception, behind-the-scenes tour and spectacular sky show. The Adler is at 1300 South Lake Shore Drive, a short distance from McCormick Center. Buses will depart the hotel at 5:45 p.m. Return transportation will also be provided.

Thursday, November 7

8:30 a.m. to 11:30 a.m.

THE NEUTRINO FROM HELL!

Michael S. Turner, Ph.D., Professor of Physics and Astronomy and Astrophysics, University of Chicago, and Deputy Head, Astrophysics Group, Fermi National Accelerator Laboratory, Batavia

Evidence for a neutrino with a mass of 17,000 electron-volts — far heavier than any predicted by theory — has been accumulating of late. The data, however, is not yet conclusive. But if the observations hold, then the existence of such a massive neutrino will stand as perhaps the most important development in particle physics in decades. At the very least, it will call for a sharp revision in the widely accepted model scientists now use to explain the way in which the elementary particles that make up matter fit together. As such, it's the neutrino no one really wants — the neutrino from hell.

THE LUMPY COSMOS

George P. Efstathiou, Ph.D., Savilian Professor of Astronomy and Head of Astrophysics, Oxford University, Oxford, England

Scientists have now to confront a vexatious cosmological conundrum devolving from new, wide-swath surveys of the sky. These new studies (including just-completed redshift measurements that provide a three-dimensional view of the cosmos) strongly bolster the view that the distribution of galaxies is exceedingly non-random; that galaxies are assembled into very-large-scale structures, structures that speak of a universal "lumpiness" that cannot be explained by current cosmological models. What now seems inevitable is either a major revision or total abandonment of theory embodying the notion of "cold, dark matter."

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