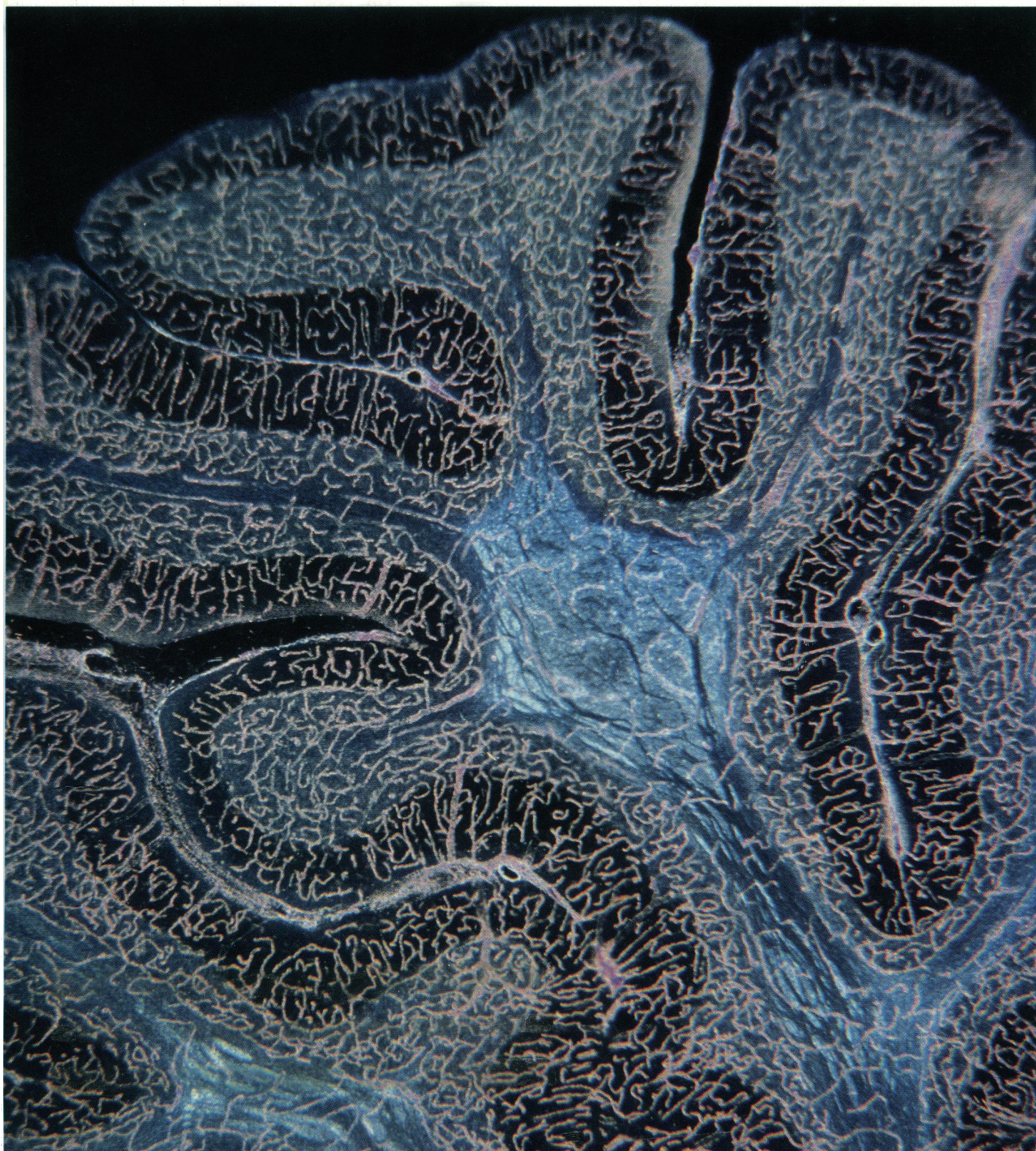


AMERICAN  
ASSOCIATION FOR THE  
ADVANCEMENT OF  
SCIENCE

# Science

13 FEBRUARY 1987  
VOL. 235 ■ PAGES 721-820

\$2.50





# Just Captured: The World of Ultracentrifugation With the SpinPro™ Expert System

Beckman proudly presents SpinPro—the first Expert System on Ultracentrifugation for the Personal Computer. Not a simulation, this truly advanced software program can shorten run times, improve the quality of separations, make more efficient use of your ultracentrifuge.

Designed for use with the IBM-PC-XT, SpinPro uses three state-of-the-art conveniences—the Mouse Cursor, Pop-Up Menus, and a Browser—to move you through the program with no keyboarding.

#### **Consults, Informs, Calculates**

*Consultation:* Designs detailed run plans through a question-and-answer dialogue. Produces an Optimal Plan—the

best possible procedure with no limits on equipment—and a Lab Plan based on the rotors and centrifuges you have. Increases efficiency. Maximizes productivity!

*Information:* Gives access to the most complete compendium of ultracentrifugation data ever compiled including sample materials, separation methods, density gradients. Contains hundreds of references. A Glossary too! Simplifies data retrieval. Updates lab procedures.

*Calculation:* Performs a variety of calculations—rotor speed reductions, pelleting times,  $k$  factors, and more. Saves time. Eliminates errors!

Now you can have a knowledgeable advisor at your command in your own lab—the SpinPro Expert System!

For SpinPro Brochure SB-664, write Beckman Instruments, Inc., Spinco Division, 1050 Page Mill Road, Palo Alto, CA 94304, or call (800) 362-2248. Offices in major cities worldwide.



## BECKMAN

Circle No. 179 on Readers' Service Card



# Your Source for GROWTH FACTORS



The cytokine laboratories at *R and D Systems* isolate rare growth factors to the highest levels of purity and activity, and provide them at more affordable prices. All of our factors are assessed for purity by silver-stained gels, a.a. composition, and N-terminus sequencing. Activities are determined both in our own laboratories, as well as in those of established investigators in the field. To place an order, request product information or technical bulletins, call

CAT. NO.	FACTOR	PURITY	ACTIVITY (ED <sub>50</sub> )
100-B	hTGFβ	>97	0.1–1.0 ng/ml <sup>1</sup>
101-B1	pTGFβ1	>97	0.1–1.0 ng/ml <sup>1</sup>
101-B2	pTGFβ2	>96	0.1–1.0 ng/ml <sup>2</sup>
120-HD	hPDGF	>95	1–3 ng/ml <sup>3</sup>
125-PD	pPDGF	>96	1–3 ng/ml <sup>4</sup>
132-FA	bFGF(a)	>96	1–4 ng/ml <sup>5</sup>
133-FB	bFGF(b)	>94	0.05–0.1 ng/ml <sup>5</sup>

**1 (800) 328-2400**

In Minnesota (612) 379-2956  
Telex 750627



R & D Systems, Inc.  
614 McKinley Place N.E.  
Minneapolis, MN 55413

- Transforming growth factor type beta isolated from human platelets (hTGFβ) or from porcine platelets (pTGFβ1) is sequentially (first 50 a.a.) and biologically identical. Both give an ED<sub>50</sub> of 0.1–0.4 ng on NRK (49F) cells when assayed as per Assoian et al JBC 258, 7155, 1983, and 0.8–1.0 ng/ml on AKR (2B) after Tucker et al CAN RES 43, p1581, 1983.
- pTGFβ2 is a structurally distinct second form of TGFβ (sequence homology 70% in the first 50 a.a. to hTGFβ/pTGFβ1). When assayed as above, it gives the same ED<sub>50</sub>s on NRK and AKR cells. However, some cell lines can distinguish between pTGFβ2 versus pTGFβ1/hTGFβ.
- Human platelet derived growth factor hPDGF is assayed on Balb/c-3T3 and NIH-3T3 cells for H<sup>3</sup>-thymidine incorporation as per Raines and Ross, Meth. in Enz. 109, p749.
- Porcine PDGF is structurally very different from hPDGF (i.e. differs in M.W., subunit composition, N-terminus), its activity is determined as in 3 above.
- Both the acidic and basic forms of bovine fibroblast growth factor are isolated from brain and assayed for H<sup>3</sup>-thymidine incorporation on NR6-3T3 cells after Gospodarowicz, et al JBC, 253, p3736, 1978.

Circle No. 169 on Readers' Service Card

727 This Week in *Science*

## Editorial

729 Epidemics and Civil Rights

## Letters

730 Net Primary Production: Original Calculations: P. M. VITOUSEK, P. R. EHRLICH, A. H. EHRLICH, P. A. MATSON ■ Teacher Training: V. C. LOPRESTI; C. C. DENMAN

## Perspective

731 Human  $\beta_2$  Interferon and B-Cell Differentiation Factor BSF-2 Are Identical: P. B. SEHGAL, L. T. MAY, I. TAMM, J. VILČEK

## News & Comment

- 736 British Researchers Seek SDI Funds
- 738 Emigrés Express Caution on Soviet Human Rights ■ Sakharov Sends Message to Vienna
- 740 RAC Recommends Easing Some Recombinant DNA Guidelines ■ . . . German Moratorium Urged
- 741 *Briefing:* Minnesota Gets Institute for Theoretical Physics ■ Comings and Goings
- 742 Science Gets Short End in Foreign Aid Funding
- 743 Boland, NASA at Odds Over Launch of Mars Observer

## Research News

- 744 Another El Niño Surprise in the Pacific, But Was It Predicted?
- 745 Wet-Nursing Boom in England Explored
- 747 National Academy Looks at Human Genome Project, Sees Progress
- 748 Debate over Emergence of Human Tooth Pattern

## Articles

- 751 Space Research: At a Crossroads: F. B. McDONALD
- 755 Solar Neutrinos: Questions and Hypotheses: J. WENESER AND G. FRIEDLANDER
- 760 Solar Neutrinos: Experimental Approaches: G. FRIEDLANDER AND J. WENESER
- 766 Splicing of Messenger RNA Precursors: P. A. SHARP

- SCIENCE is published weekly on Friday, except the last week in December, and with an extra issue in February by the American Association for the Advancement of Science, 1333 H Street, NW, Washington, DC 20005. Second-class postage (publication No. 484460) paid at Washington, DC, and at an additional entry. Now combined with *The Scientific Monthly*® Copyright © 1987 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$65. Domestic institutional subscription (51 issues): \$98. Foreign postage extra: Canada \$32, other (surface mail) \$27, air-surface via Amsterdam \$65. First class, airmail, school-year, and student rates on request. Single copies \$2.50 (\$3 by mail); back issues \$4 (\$4.50 by mail); Biotechnology issue, \$5.50 (\$6 by mail); classroom rates on request; Guide to Biotechnology Products and Instruments \$16 (\$17 by mail). **Change of address:** allow 6 weeks, giving old and new addresses and seven-digit account number. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$1 per copy plus \$0.10 per page is paid directly to CCC, 21 Congress Street, Salem, Massachusetts 01970. The identification code for *Science* is 0036-8075/83 \$1 + .10. **Postmaster:** Send Form 3579 to *Science*, 1333 H Street, NW, Washington, DC 20005. *Science* is indexed in the *Reader's Guide to Periodical Literature* and in several specialized indexes.
- The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objects are to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.





**COVER** Dark-field photomicrograph of cerebellar angioarchitecture demonstrated after systemic administration of horseradish peroxidase in rats bearing cortical transplants. The glycoprotein permeates portions of these transplants, which lack normal barrier properties, and subsequently enters and circulates in the cerebrospinal fluid. The vasculature is highlighted by histochemical detection of protein in perivascular spaces. See page 772. [J. M. Rosenstein, Department of Anatomy, George Washington University Medical Center, Washington, D.C. 20037]

## Reports

- 772 Neocortical Transplants in the Mammalian Brain Lack a Blood-Brain Barrier to Macromolecules: J. M. ROSENSTEIN
- 774 Identification and Isolation of a Variant Surface Glycoprotein from *Trypanosoma vivax*: P. R. GARDINER, T. W. PEARSON, M. W. CLARKE, L. M. MUTHARIA
- 777 Synthesis of a Site-Specific DNA-Binding Peptide: M. F. BRUIST, S. J. HORVATH, L. E. HOOD, T. A. STEITZ, M. I. SIMON
- 780 Epitope Mapping by Chemical Modification of Free and Antibody-Bound Protein Antigen: A. BURNENS, S. DEMOTZ, G. CORRADIN, H. BINZ, H. R. BOSSHARD
- 783 Leader Peptidase of *Escherichia coli*: Critical Role of a Small Domain in Membrane Assembly: R. E. DALBEY AND W. WICKNER
- 787 Avian v-myc Replaces Chromosomal Translocation in Murine Plasmacytomagenesis: M. POTTER, J. F. MUSHINSKI, E. B. MUSHINSKI, S. BRUST, J. S. WAX, F. WIENER, M. BABONITS, U. R. RAPP, H. C. MORSE, III
- 790 Isolation of a T-Lymphotropic Virus from Domestic Cats with an Immunodeficiency-Like Syndrome: N. C. PEDERSEN, E. W. HO, M. L. BROWN, J. K. YAMAMOTO

## AAAS Meetings

- 796 *R&D Policies, Budgets, and Economic Competitiveness*: Advanced Registration Form; Hotel Reservation Form

## Book Reviews

- 798 The American College and the Culture of Aspiration, 1915-1940, reviewed by D. KAREN ■ Low Tech Education in a High Tech World, H. M. LEVIN ■ Solar Radiophysics, R. G. STONE ■ Flora of the Great Plains, N. R. MORIN ■ Books Received

## Products & Materials

- 802 Symbolic Math Calculator ■ Protein Structure Software ■ Second-Generation Lab Management Software ■ Flow Cytometer ■ Remote Weighing Ultra Microbalance ■ Computer Touch Screen ■ Literature

### Board of Directors

Gerard Piel  
Retiring President,  
Chairman  
Lawrence Bogorad  
President  
Sheila E. Widnall  
President-elect

Robert McC. Adams  
Robert W. Berliner  
Floyd E. Bloom  
Mary E. Clutter  
Mildred S. Dresselhaus  
Donald N. Langenberg  
Dorothy Nelkin  
Linda S. Wilson  
William T. Golden  
Treasurer  
William D. Carey  
Executive Officer

### Editorial Board

Elizabeth E. Bailey  
David Baltimore  
William F. Brinkman  
Philip E. Converse  
Joseph L. Goldstein  
James D. Idol, Jr.  
Leon Knopoff  
Seymour Lipset  
Oliver E. Nelson  
David V. Ragone  
David M. Raup  
Vera C. Rubin  
Larry L. Smarr  
Solomon H. Snyder  
Robert M. Solow  
James D. Watson

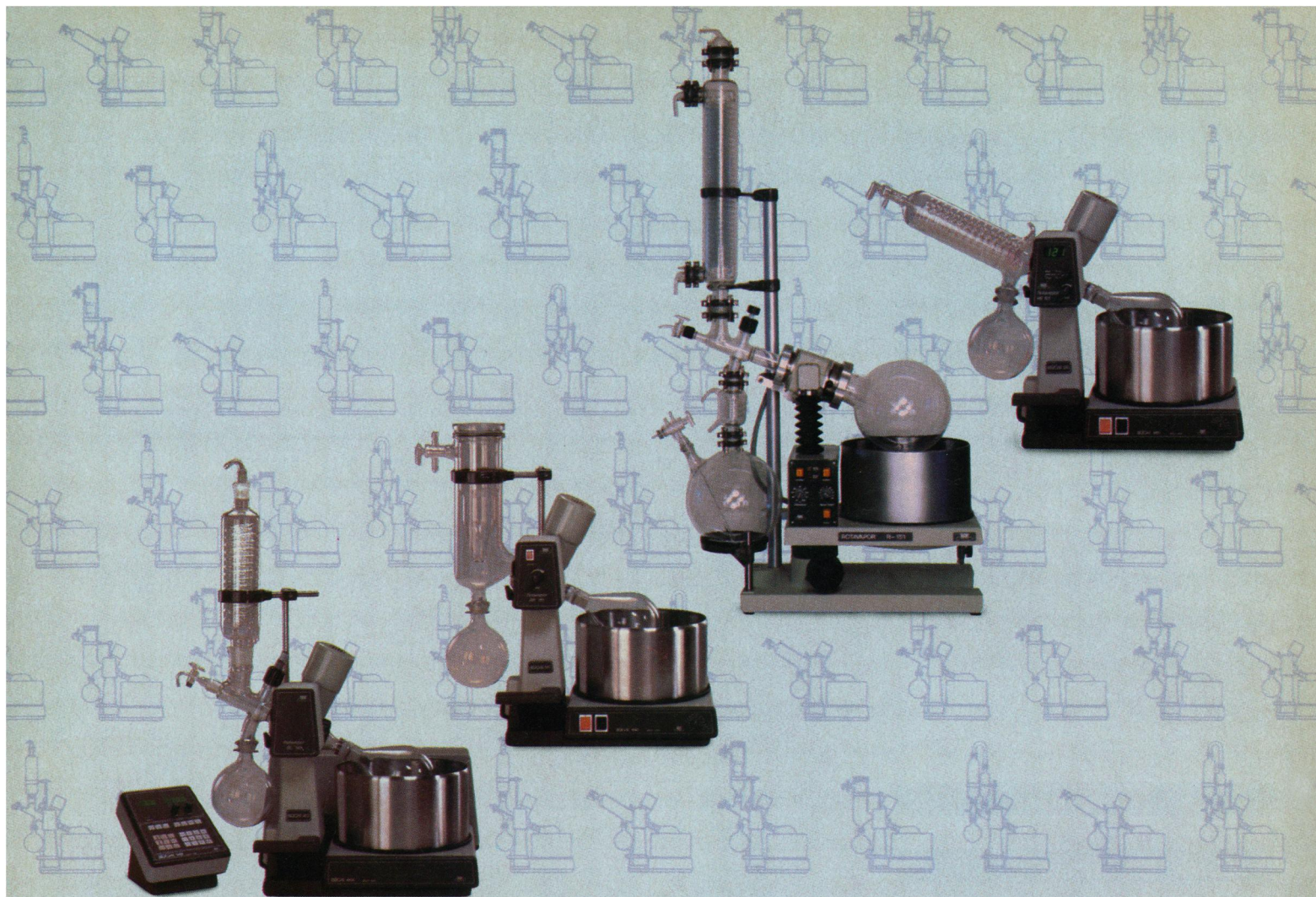
### Board of Reviewing Editors

John Abelson  
Qais Al-Awqati  
James P. Allison  
Don L. Anderson  
Elizabeth H. Blackburn  
Floyd E. Bloom  
Charles R. Cantor  
James H. Clark  
Bruce F. Eldridge  
Stanley Falkow  
Theodore H. Geballe  
Roger I. M. Glass  
Stephen P. Goff  
Robert B. Goldberg

Corey S. Goodman  
Stephen J. Gould  
Richard M. Held  
Gloria Heppner  
Eric F. Johnson  
Konrad B. Krauskopf  
I. Robert Lehman  
Karl L. Magleby  
Joseph B. Martin  
John C. McGiff  
Alton Meister  
Mortimer Mishkin  
Peter Olson  
Gordon H. Orians  
John S. Pearce

Yeshayau Pocker  
Jean Paul Revel  
James E. Rothman  
Thomas C. Schelling  
Ronald H. Schwartz  
Stephen M. Schwartz  
Otto T. Solbrig  
Robert T. N. Tjian  
Virginia Trimble  
Geerat J. Vermeij  
Martin G. Weigert  
Harold Weintraub  
Irving L. Weissman  
George M. Whitesides  
Owen N. Witte  
William B. Wood





# Büchi gives you more.

Rotary evaporators to meet more needs,  
giving you more value.

Move up to Büchi. Whether it's a fully automated evaporation system with microprocessor control or a basic rotary evaporator, there's a Büchi Rotavapor<sup>†</sup> designed to fit your needs.

**More versatility and reliability.** Büchi rotary evaporators handle volumes as low as 5 mL and up to 50 L or more. A wide range of models and glassware assemblies lets you choose a system for most any solvent, any application, any need. Büchi rotary evaporators are built to give you years of reliable service.

**More convenience and efficiency.**

Büchi rotary evaporators have constant high-torque drives for efficient evaporation regardless of load. The improved quick-action Servo-Jack<sup>™</sup> makes it easier than ever to lower and raise the evaporator into and out of the bath. And vertical condensers such as the cold trap increase condensation efficiency and save valuable bench space.

**More safety.** Büchi rotary evaporators feature variable speed sparkless induction motors. Plastic nozzles on condensers provide safer tube connections. And heating baths have low-liquid-level protection and over-temperature safety shutoff.

**More value for you.** Move up to Büchi for the widest equipment range, intelligent design, and reliable performance. Move up for versatility, convenience, efficiency, and safety—for outstanding *value* that has made Büchi the world's best seller.

For more information: call 800-645-3050; in New York, 516-334-7500. Or write Brinkmann Instruments, Inc., Cantiague Road, Westbury, NY 11590. (In Canada: 416-675-7911; 50 Galaxy Blvd., Rexdale, Ont. M9W 4Y5)

<sup>†</sup>Rotavapor<sup>®</sup> is a registered trademark of Büchi Laboratoriums-Technik AG.

See us at the 1987 Pittsburgh Conference Booths #6000-6015.

**Büchi**

Shaping the future.

**Brinkmann**  
INSTRUMENTS, INC.

BRK-5396

For literature circle reader service number 116  
For a demonstration circle reader service number 117



## This Week in SCIENCE

### Solar neutrino puzzle

MOST products of the thermonuclear reactions that occur in the sun's interior remain there, according to the "standard solar model," but some of the energy generated is released as neutrinos (pages 755 and 760). These subatomic, almost massless, neutral particles travel close to the speed of light and are capable of passing through matter, including the earth and the sun. The first experiment to try to "catch" neutrinos was set up 20 years ago: deep in a South Dakota gold mine (shielded from cosmic rays), chlorine-37 in a tank filled with dry cleaning solution ( $\text{C}_2\text{Cl}_4$ ) would be changed to a detectable radioactive substance, argon-37, if bombarded by neutrinos. Although neutrino bombardment and capture did occur, only a third the number of neutrinos expected was detected. The "solar neutrino puzzle," the discrepancy between prediction and findings, is the subject of two articles by Friedlander and Weneser. First, the theoretical efforts to account for the discrepancy are reviewed; these involve reappraisals of basic assumptions about the interior, dynamics, and evolution of the sun or reevaluations of neutrino properties. Second, new experimental approaches in progress and under consideration for solving the puzzle are described.

### Trypanosome antigen

TRYPANOSOMIASIS of cattle is a devastating infection that has caused problematic economic losses in Africa, South America, and the Caribbean region (page 774). The agent, *Trypanosoma vivax*, is less well studied than other trypanosomes: it is fragile, difficult to grow in laboratory hosts, and frequently switches its surface antigens. Parasites spend part of their lives in the proboscis of tsetse flies and part in cattle; they are passed along or picked up when flies bite cows. Gardiner *et al.* have characterized a surface component of *T. vivax*, the variant surface glycoprotein (VSG), and compared its features to those of VSGs of *T.*

*brucei*, a related organism. The VSG of *T. vivax*, though smaller and more hydrophobic, contains constituents similar to those of other VSGs and may be anchored in the membrane by a similar fatty acid. These characterizations make possible the analyses of underlying genetic mechanisms that account for molecular variations in the VSG, variations that allow the organism to elude host defenses.

### Epitope mapping

EPITOPES, structures on the surface of complex antigenic molecules, are being studied with a new modification technique (page 780). The strategy helps define what amino acids are present in difficult-to-study discontinuous conformational epitopes that form when the protein folds and distant amino acids are brought close together. Burnens *et al.* chemically modified lysines and threonines of the protein cytochrome c. The modification was carried out both when the protein was complexed with a monoclonal antibody that reacts with one of its epitopes and when the protein was uncomplexed. Only two lysines and no threonines were modified more slowly when the antibody was bound, thereby identifying which amino acids participated in the epitope. Although the two involved lysines are 38 residues apart in the amino acid chain, crystallographic studies have shown that they are brought to within 7 angstroms of each other when the molecule folds. This method complements others already in use for mapping epitopes; mapping is crucial for fundamental studies and practical pursuits such as vaccine development.

### Oncogene deregulation and tumor induction

PLASMACYTOMA cells (tumors of antibody-producing plasma cells) of mice and Burkitt lymphoma cells of humans are among the tumor cells that characteristically show two anomalies—chromosomal transloca-

tions and deregulation of the *myc* oncogene; a causal relation between the anomalies and tumor development has remained difficult to establish (page 787). Now it has been shown that plasmacytomas can be induced in mice in the absence of a chromosomal translocation as long as an active *myc* oncogene is present. This more closely ties the activation of the oncogene to tumor formation. Tumors were induced with pristane and a viral construct, called J-3, that carries an active avian *myc* oncogene. Plasmacytomas formed more rapidly than when induced by pristane alone, and most had no chromosomal rearrangements; they did have an integrated J-3 virus, and they actively expressed *myc*. Potter *et al.* speculate that, although deregulation of *myc* expression is apparently necessary for plasmacytoma induction, it may not be sufficient; other alterations of normal gene functions may be needed to complete the transformation of normal cells to tumor cells. This system is suitable for testing the oncogenic potential of other new viral constructs.

### Viral disease in cats

THE well-being of cats in an established cattery deteriorated after a cat developed diarrhea, anemia, neurologic abnormalities, and rhinitis and other infections, aborted a litter, and died; during the next 4 years, nine other cats in the same pen developed similar disease and died (page 790). The virus responsible for the disease was isolated by Pedersen *et al.* and compared with the human AIDS virus; disease was transmitted experimentally to pathogen-free kittens. The new virus, called feline T-lymphotropic lentivirus (FTLV), is antigenically distinct from other cat viruses and from the AIDS virus. However, FTLV resembles the AIDS virus in morphology, in having a strong tropism for T cells, in metal requirements for the functioning of its reverse transcriptase, and in its ability to cause a disease similar to AIDS. Although this virus poses a threat to cat populations, it and the cats that harbor it may help in the study of AIDS.



NEW FROM NIKON

Professional image...  
educational price.



The new Nikon Alphaphot brings to the classroom and laboratory high resolution CF optics, a bright 20W tungsten illuminator and rugged construction. Now you can get long term professional performance and Nikon system capabilities for an incredibly low investment.

With new CF-E Series objectives, the Alphaphot delivers unrivalled color fidelity, sharpness, and flatness of field. And, as part of the Nikon system, the Alphaphot is capable of phase contrast, darkfield, epi-fluorescence and polarized light. In addition, the Alphaphot is available with quartz-halogen Koehler illumination for critical applications and photomicrography.

The Alphaphot is designed with education in mind: rugged alloy stand, built-in stage-stop mechanism, and spring-loaded 40X and 100X objectives protect both microscope and specimen from accidental damage, while locking mechanisms on all optical and mechanical components protect against tampering.

And yet the Alphaphot is surprisingly affordable. It's also backed by a five-year full warranty and a nationwide network of sales and service representatives. See your Nikon dealer today for a demonstration. Or contact Nikon Inc., Instrument Group, 623 Stewart Avenue, Garden City, N.Y. 11530 (516) 222-0200

# NIKON ALPHAPHOT

For information circle reader service number 125  
For a demonstration circle reader service number 162

**Nikon**  
Extending Man's Vision



## American Association for the Advancement of Science

*Science* serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by the AAAS or the institutions with which the authors are affiliated.

**Publisher:** William D. Carey

**Editor:** Daniel E. Koshland, Jr.

**Deputy Editors:** Philip H. Abelson (*Engineering and Applied Sciences*); John I. Brauman (*Physical Sciences*)

## EDITORIAL STAFF

**Managing Editor:** Patricia A. Morgan

**Assistant Managing Editors:** Nancy J. Hartnagel, John E. Ringle

**Senior Editors:** Eleanore Butz, Ruth Kulstad

**Associate Editors:** Martha Collins, Barbara Jasny, Katrina L. Kelner, Edith Meyers, Phillip D. Szurromi, David F. Voss

**Letters Editor:** Christine Gilbert

**Book Reviews:** Katherine Livingston, *editor*; Deborah F. Washburn

**This Week in Science:** Ruth Levy Guyer

**Chief Production Editor:** Ellen E. Murphy

**Editing Department:** Lois Schmitt, *head*; Caitlin Gordon, Mary McDaniel, Barbara E. Patterson

**Copy Desk:** Lyle L. Green, Sharon Ryan, Beverly Shields, Anna Victorreen

**Production Manager:** Karen Schools

**Graphics and Production:** John Baker, *assistant manager*; Holly Bishop, Kathleen Cosimano, Eleanor Warner

**Covers Editor:** Grayce Finger

**Manuscript Systems Analyst:** William Carter

## NEWS STAFF

**News Editor:** Barbara J. Culliton

**News and Comment:** Colin Norman, *deputy editor*; Mark H. Crawford, Constance Holden, Eliot Marshall, Marjorie Sun, John Walsh

**Research News:** Roger Lewin, *deputy editor*; Deborah M. Barnes, Richard A. Kerr, Gina Kolata, Jean L. Marx, Arthur L. Robinson, M. Mitchell Waldrop

**European Correspondent:** David Dickson

## BUSINESS STAFF

**Associate Publisher:** William M. Miller, III

**Business Staff Manager:** Deborah Rivera-Wienhold

**Membership Recruitment:** Gwendolyn Huddle

**Member and Subscription Records:** Ann Ragland

**Guide to Biotechnology Products and Instruments:**

Shauna S. Roberts

## ADVERTISING REPRESENTATIVES

**Director:** Earl J. Scherago

**Production Manager:** Donna Rivera

**Advertising Sales Manager:** Richard L. Charles

**Marketing Manager:** Herbert L. Burklund

**Sales:** New York, NY 10036: J. Kevin Henebry, 1515 Broadway (212-730-1050); Scotch Plains, NJ 07076: C. Richard Callis, 12 Unami Lane (201-889-4873); Chicago, IL 60611: Jack Ryan, Room 2107, 919 N. Michigan Ave. (312-337-4973); San Jose, CA 95112: Bob Brindley, 310 S. 16 St. (408-998-4690); Dorset, VT 05251: Fred W. Dieffenbach, Kent Hill Rd. (802-867-5581); Damascus, MD 20872: Rick Sommer, 24808 Shrubbery Hill Ct. (301-972-9270); U.K., Europe: Nicholas Jones, +44(0)64752918.

Instructions for contributors appears on page xi of the 19 December 1986 issue. Editorial correspondence, including requests for permission to reprint and reprint orders, should be sent to 1333 H Street, NW, Washington, DC 20005. Telephone: 202-326-6500.

Advertising correspondence should be sent to Tenth Floor, 1515 Broadway, NY 10036. Telephone 212-730-1050 or WU Telex 968082 SCHERAGO.

## Epidemics and Civil Rights

**A**n epidemic involving a lingering fatal disease is difficult to handle under the best conditions. An individual who knows death is certain is naturally reluctant to spend the twilight hours isolated and feared by friends; yet the picture of an individual who knowingly spreads a fatal infection and also refuses to help in its containment is equally unpleasant. Reluctance to provide information to authorities is compounded if there is fear of exposure of a sexual preference that is still not accepted by a sizable fraction of the population. Clearly this is a matter that must be handled with great delicacy and restraint, but it cannot be swept under the rug while the epidemic grows.

It is a tragedy of history that, at a time when a more enlightened attitude toward homosexual preferences is emerging in our society, we are also confronted with an epidemic of AIDS. Increased scientific understanding and public education had begun to convince society that homosexuality is a statistical fact and a natural event of the human condition, neither to be praised nor condemned. The epidemic of AIDS, identified here with parts of the homosexual population, has interrupted that educational process and produced an unfortunate confrontation between civil rights and public health.

The latest medical evidence indicates that the incubation period of the AIDS virus may be much longer than originally thought, and therefore many people who were thought only to have a latent virus are now considered likely to be able to infect others and to die. A recent National Academy of Sciences committee emphasized the importance of this evidence and urged a massive educational campaign.\* The containment effort will certainly not be helped if it is clouded by two emotionally charged issues.

The first of these concerns civil rights: the concept that those with a minority behavioral pattern should not be asked to accede to public health restrictions that might expose them to ridicule. Ironically, the spread of AIDS into the heterosexual population may soon make that issue moot, but those who delay intelligent and balanced attempts to control the epidemic will only add more acrimony and emotionalism to an already complex problem. The freedom of consenting adults in private to practice their own sexual preferences should be a civil right. The freedom to infect others is a civil wrong. The homosexual community has a right to demand that whatever restraints are deemed in the public interest must be applied equally to all individuals. The public has a right to say, "Let us not confuse a civil right with a civil wrong."

The second concerns the right to privacy: the concept that society may not use coercion to obtain information from a carrier of a disease. Coercion should be—and is—limited, but public emotionalism on this issue may become more severe as the epidemic spreads. It would be far better to devise now humane and intelligent procedures to limit the spread of AIDS. Other countries, such as Scandinavian nations, have imposed demands to reveal private information, such as the paternity of a child, but have also provided excellent safeguards to keep that information confidential. Society does not compel individuals to take sobriety tests and libitum, but willingness to undergo a breath test is an appropriate requirement for obtaining a driver's license. In a similar exchange, society could say to a potential AIDS victim, "You must help us by giving information in return for the medical and financial assistance that we are providing you."

Solutions to the problem must be practical and civilized, but they should not be clouded by an inappropriate assessment of "rights." The clean water issue illustrates that past history cannot always be a guide to present problems: in the 1800s when the country had a much smaller population, the dumping practices of chemical plants could be tolerated to a degree impossible today with our concentrated population and highly chemical society. The nature of the epidemics that threaten us today has also changed, and the mobility and anonymity of the population require new approaches to epidemiology. Individuals personally threatened by AIDS should be treated with humanity and dignity; they, in turn, should be willing to provide the information which will enable society to protect others and attempt to control this terrible scourge.—DANIEL E. KOSHLAND, JR.

\*National Academy of Sciences, *Confronting AIDS* (National Academy Press, Washington, DC, 1986).



# The care to meet to know, to understand.

Ares-Serono Symposia is an independent foundation, created in 1971, to promote scientific research in all disciplines which contribute towards improving human health.

This aim is pursued by means of congresses, courses, seminars and specialized studies.

Some of the international meetings scheduled for 1987 are:

**Herpes and Papilloma Viruses**

Milan, Italy / March 26-27

Scientific Organization: F. De Palo (I), F. Rilke (I) and H. Zur Hausen (D)

**IV Pan American Congress of Andrology**

São Paulo, Brazil / May 4-6

Scientific Organization: A. Negro-Vilar (USA) and M. P. De Castro (BZ)

**Inhibin - Non-Steroidal Regulation of Follicle Stimulating Hormone Secretion**

Tokyo, Japan / May 21-22

Scientific Organization: H. Burger (Aus) and M. Igarashi (J)

**Development and Function of the Reproductive Organs**

Turku, Finland / June 10-12

Scientific Organization: M. Parvinen (SF)

**IV Colloquium of the European Pineal Study Group**

Modena, Italy / August 31 - September 4

Scientific Organization: G.P. Trentini (I), A. Oksche (D) and P. Pèvet (F)

**Cell-to-Cell Communication in Endocrinology**

Florence, Italy / October 8-9

Scientific Organization: L. Martini (I), M. Serio (I) and C.W. Bardin (USA)

**Differentiation Therapy for Cancer**

Tucker's Town, Bermuda / October 23-25

Scientific Organization: G.B. Rossi (I), F. Takaku (J) and S. Waxman (USA)



**ARES  
SERONO  
SYMPOSIA**

Do you know all the advantages that the Ares-Serono Symposia Congress Card offers? Please fill in this form and mail to Ares-Serono Symposia for information.



**swissair**  Official Carrier

I would like to receive information about:

- ☐ Ares-Serono Symposia Congress Card
- ☐ All the above Congresses
- ☐ In particular the Congress on .....

☐ Ares-Serono Symposia Publications

Name .....

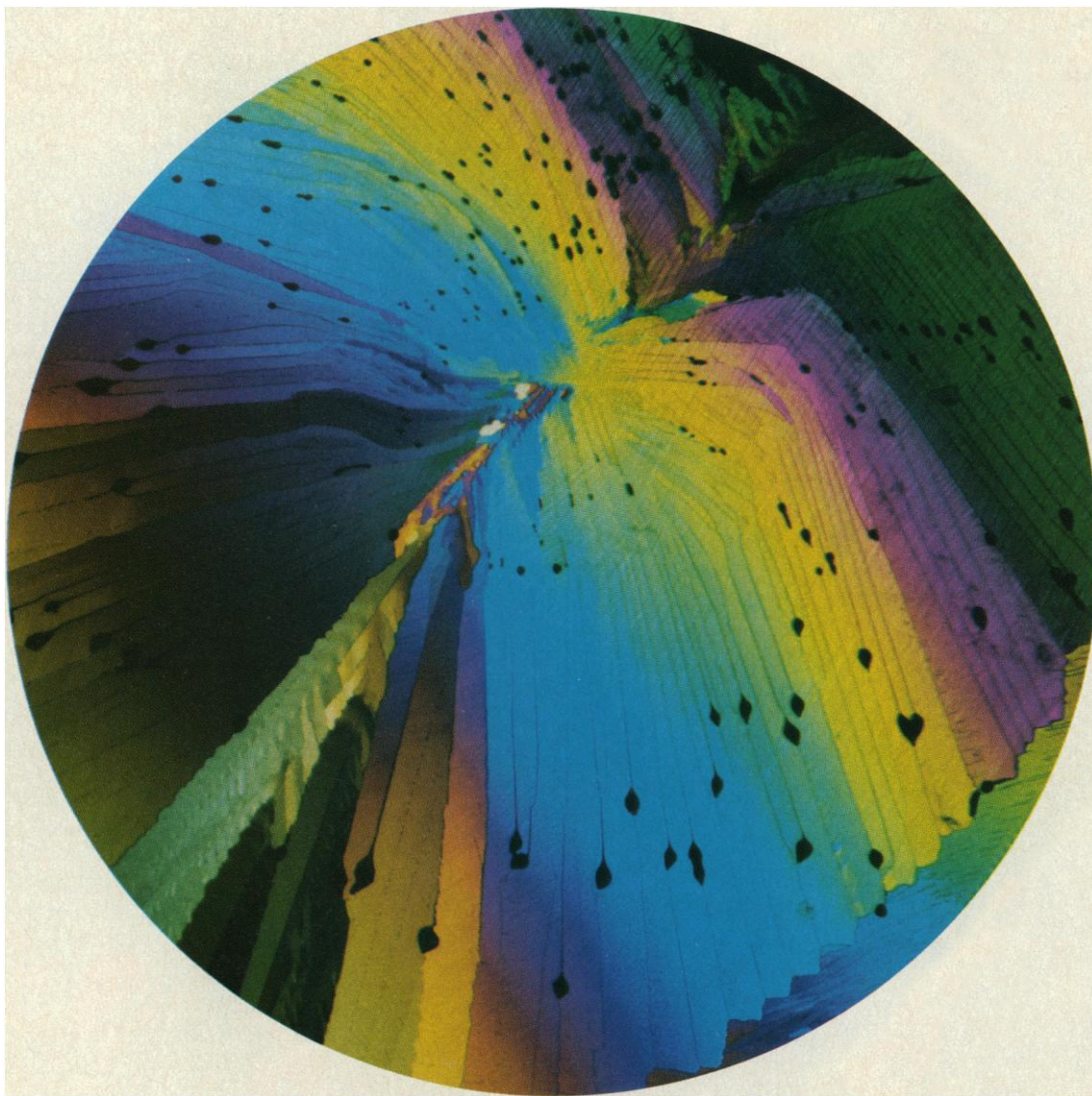
Address .....

Institution .....

Please send to Ares-Serono Symposia,  
Via Ravenna 8 - 00161 Rome - Italy

SC





# Research

**Get the results you want instantly with Polaroid instant films and imaging systems.**

Research and development may be the place to experiment. But you shouldn't have to experiment with your means of documentation.

For that, you want the most effective and fastest method available right from the start. You want, in short, Polaroid instant imaging.

With our full line of over 40 different

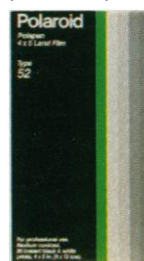
instant professional films, from 35 mm to 8 x 10", you can be sure of capturing the results you want, when you want them. Which means

you can document, review, or present your findings without delays. With detailed accuracy.

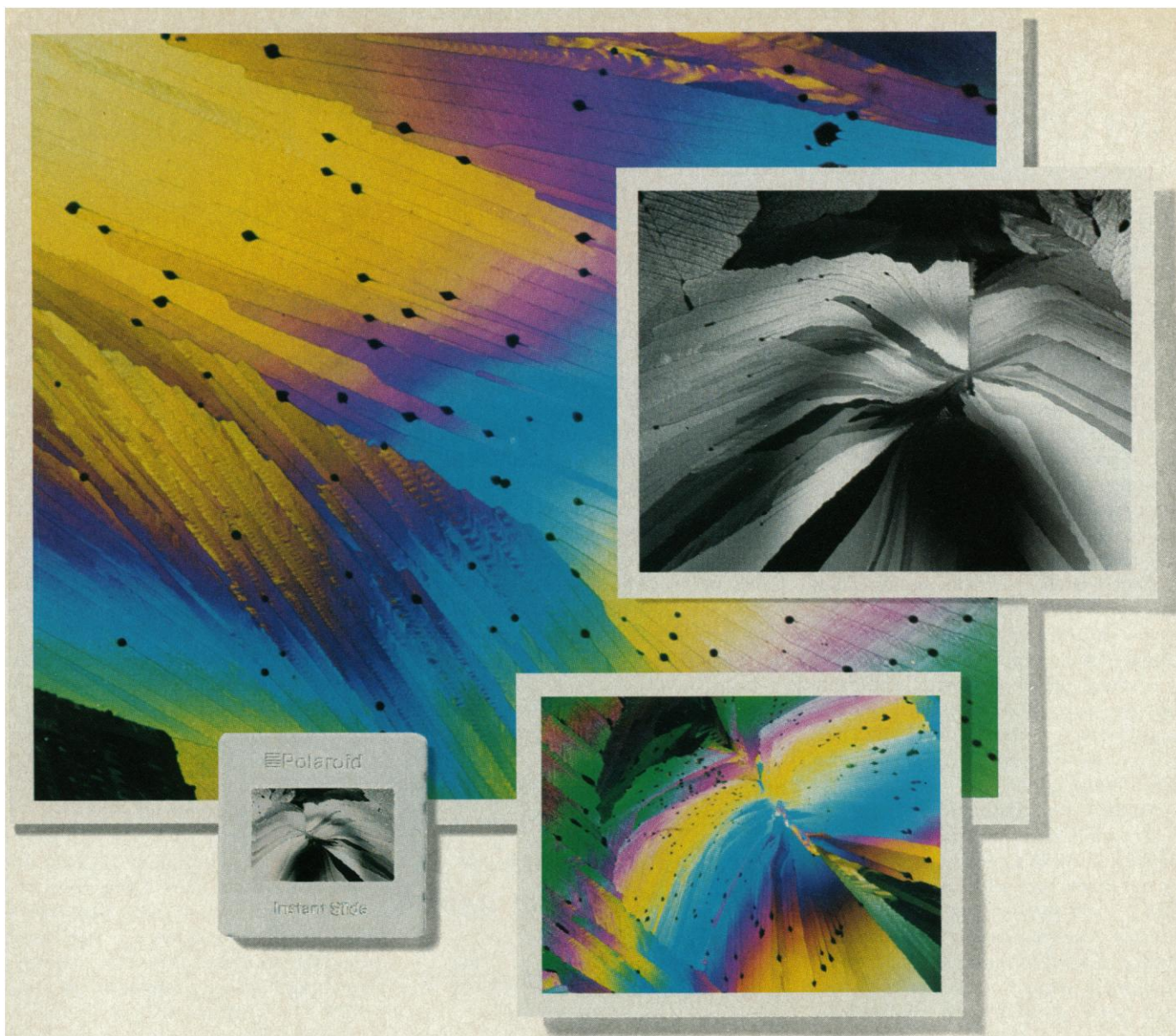
Polaroid also lets you choose from a complete range of color or black and

white emulsions that meet the imaging requirements of virtually any research condition. In the formats and film types you really need.

What's more, we offer you a comprehensive range of instant imaging systems. Cameras for photography of laboratory set-ups. Copy stands for recording flat art or small objects. Plus electronic imaging







# and development.

systems for recording from most types of computers—PC's to mainframes—and from VCR's as well.

Better still, you can do it all yourself. In house, in complete confidentiality. Without the delays that outside services create.



In fact, no matter where your research takes you, you can look to Polaroid imaging systems for the means

to handle any development.

Instantly.

For the Polaroid Professional Film Center nearest you, call toll-free 800-225-1618, 9 a.m. to 6 p.m. Eastern Time.

**Polaroid**

© 1987 Polaroid Corporation "Polaroid"®

For more information, mail this coupon to Polaroid Corporation, Dept. 659, P.O. Box 5011, Clifton, NJ 07015.

Please send me information about:

- ☐ Polaroid Professional Films for Scientific Imaging  
☐ Polaroid Instant Imaging Hardware

Name

Company

Address

City

State  Zip

Telephone  SC 2/13

Circle No. 181 on Readers' Service Card



# THE SIXTH ANNUAL CONGRESS FOR **HYBRIDOMA RESEARCH**

**MARCH 1 - 4, 1987**  
**MOSCONE CENTER, SAN FRANCISCO, CALIFORNIA**

Organized by Scherago Associates, Inc. and Mary Ann Liebert, Inc., publishers

## *Co-Chairmen:*

Zenon Steplewski, The Wistar Institute, Philadelphia, PA  
Hilary Koprowski, The Wistar Institute, Philadelphia, PA  
Joseph Davie, Washington University, St. Louis, MO

## **SESSIONS**

### **KEYNOTE ADDRESS** (Sunday P.M.)

Genetics and Biochemistry of Retroviral Replication  
Stephen Goff, Columbia University, College of Physicians and Surgeons  
Left-Handed and Right-Handed DNA in Genetic Recombination  
Alexander Rich, Massachusetts Institute of Technology

### **ACQUIRED IMMUNE DEFICIENCY SYNDROME (AIDS)**

(Monday A.M. - P.M.)

**Chairman:** Erling Norrby, Karolinska Institutet, Stockholm, Sweden

**Speakers:** Luc Montagnier, Paris William Haseltine, Boston  
Robert C. Gallo, Bethesda Myron Essex, Boston  
Jay A. Levy, San Francisco Robin Weiss, London  
Simon Wain-Hobson, Paris Dani P. Bolognesi, Durham  
Flossie Wong-Staal, Bethesda Bernard Moss, Bethesda

### **TRANSGENIC MICE AS TOOL IN IMMUNOLOGY** (Tuesday A.M.)

**Chairman:** Davor Solter, The Wistar Institute

**Speakers:** Rudolf Grosschedl, U.C.S.F.  
Ken-Ichi Yamamura, Kumamoto Univ. Medical School  
Jean-Claude Weill, Institute Jacques-Monod  
Barbara A. Knowles, The Wistar Institute

### **WORKING GROUP MEETINGS**

This year we are planning two Working Groups:

- A. IMMUNOTHERAPY** - Chairman, Michael Mastrangelo  
Thomas Jefferson University Hospital  
**B. IMMUNODIAGNOSIS** - Chairman, Edgar Haber  
Massachusetts General Hospital

*Working groups will meet in closed sessions. It is our intent to select participants actively involved in the above listed research for in-depth discussion of progress made recently. The consensus reached by working groups will be presented to the whole Congress and results of these discussions will be published in Hybridoma.*

*Investigators interested in participating in these Group Meetings should send a short summary to Dr. Zenon Steplewski, The Wistar Institute, Thirty Sixth Street At Spruce, Philadelphia, PA 19104. (215) 898-3924 by January 10, 1987.*

### **ANTI-IDIOTYPE VACCINES** (Tuesday P.M.)

**Chairman:** J. Donald Capra, University of Texas

**Speakers:** Kathryn Meek, Univ. of Texas Health Science Center  
At Dallas  
Ronald C. Kennedy, Southwestern Foundation for  
Biomedical Research  
Dorothee Herlyn, The Wistar Institute  
Karl Erik Hellström, Oncogen Inc.  
David Sacks, N.I.H.

### **THE USE OF HYBRIDOMAS IN DETERMINING CYTOKINE STRUCTURES AND FUNCTIONS** (Wednesday A.M.)

**Chairman:** Robert Schreiber, Washington University

**Speakers:** Robert Coffman, DNAX Research Institute  
Frank Fitch, Pritzler School of Medicine  
Carl Pierce, Washington University School of Medicine  
Robert Schreiber, Washington University

### **ANTI-CARBOHYDRATE MAB'S IN THE STUDY OF GLYCOLI- PID-MEDIATED CELLULAR EFFECTS** (Wednesday a.m.)

**Chairman:** Jan Thurin, The Wistar Institute

**Speakers:** David A. Cheresh, Scripps Clinic & Research Foundation  
Tomas Brodin, The Wallenberg Laboratory  
Bruce Fenderson, Fred Hutchinson Cancer Research Center  
Nobuo Hanai, Fred Hutchinson Cancer Research Center

### **SUMMARY** (Wednesday P.M.)

**Chairman:** Joseph Davie, Washington University School of Medicine

## **POSTER SESSION AND EXHIBITS**

### **REGISTRATION FEES:**

\$450 On-site registration

\$400 ADVANCE REGISTRATION - (Received by Jan. 15) \$150 STUDENT REGISTRATION - Undergraduate, graduate students only. Conf. in writing.  
4-7 registrations received together from same organization \$300 each. 8-10 registrations received together from same organization \$200 each.

Larger group rates available upon request. Cancellations must be received in writing by February 1, 1987.

Attendance will be limited. Make checks payable to: **Scherago Associates, Inc., DNA / HYBRIDOMA**

S-2-13

☐ Please reserve \_\_\_\_\_ space(s): Registration Fee of \$ \_\_\_\_\_ enclosed.

☐ Please send abstract form.

Name \_\_\_\_\_

Dept. \_\_\_\_\_ Organization \_\_\_\_\_

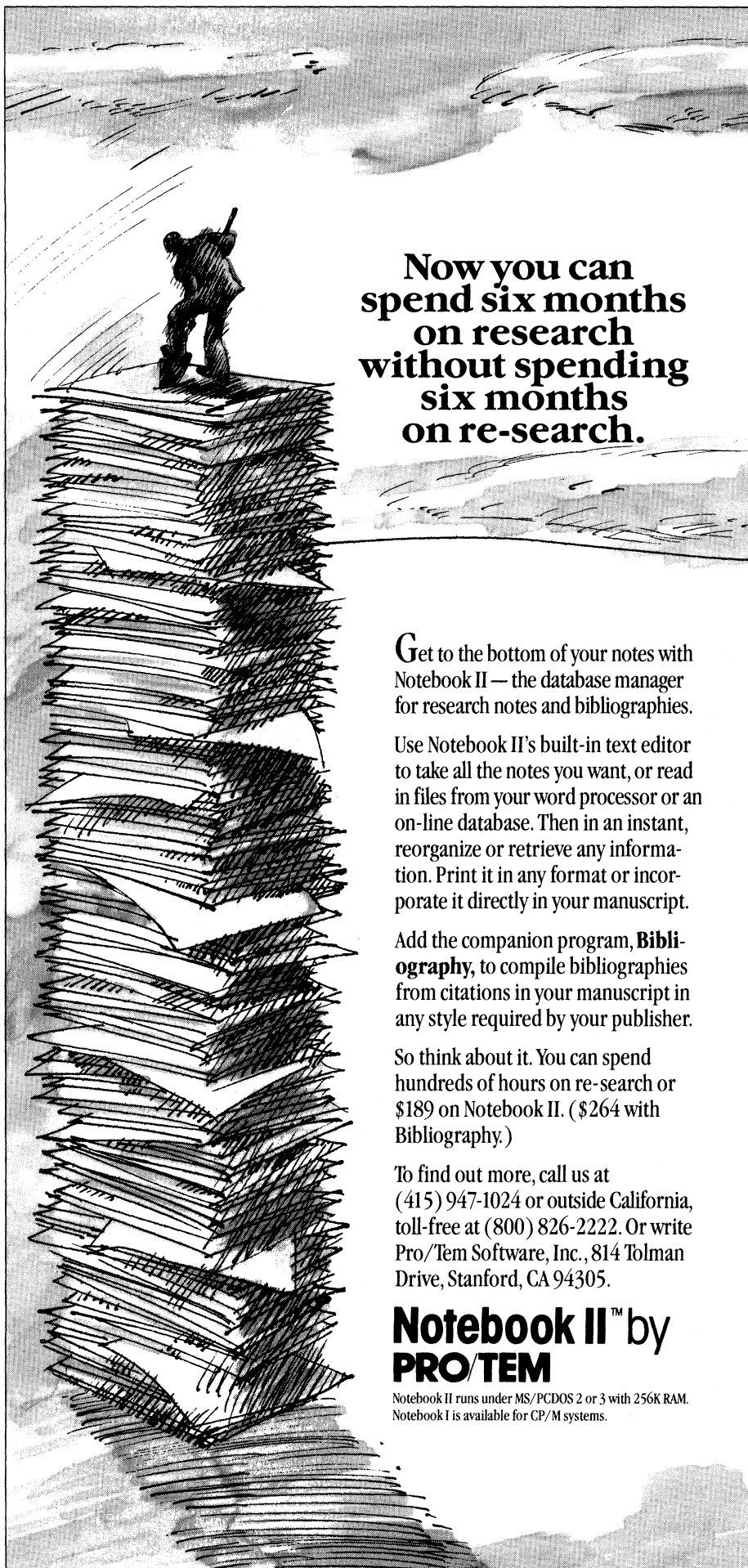
Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone: ( ) \_\_\_\_\_

Return to: **Hybridoma; c/o Scherago Associates, Inc.**, 1515 Broadway, Dept. S-2-13 New York, NY 10036 • (212) 730-1050





**Now you can  
spend six months  
on research  
without spending  
six months  
on re-search.**

Get to the bottom of your notes with Notebook II — the database manager for research notes and bibliographies.

Use Notebook II's built-in text editor to take all the notes you want, or read in files from your word processor or an on-line database. Then in an instant, reorganize or retrieve any information. Print it in any format or incorporate it directly in your manuscript.

Add the companion program, **Bibliography**, to compile bibliographies from citations in your manuscript in any style required by your publisher.

So think about it. You can spend hundreds of hours on re-search or \$189 on Notebook II. (\$264 with Bibliography.)

To find out more, call us at (415) 947-1024 or outside California, toll-free at (800) 826-2222. Or write Pro/Tem Software, Inc., 814 Tolman Drive, Stanford, CA 94305.

**Notebook II™ by  
PRO/TEM**

Notebook II runs under MS/PCDOS 2 or 3 with 256K RAM.  
Notebook I is available for CP/M systems.

## **Try A New Approach to Life Sciences— Search STN International®!**

Search STN International online to get effective answers to your life science questions. Stay current on new developments in fast-changing fields such as biotechnology, pharmaceuticals, forensic science, and immunology.

More than one-third of our CAS ONLINE® database contains life science information. Try BIOSIS Previews®, and our newest file, BIOCAS, the link between BIOSIS Previews and CAS ONLINE. All searchable with only one command language on STN!

Please fill out and clip this coupon today.

**YES: Please rush me my  
FREE STN information  
packet.**

Name \_\_\_\_\_

Organization \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_

**Mail to:**

**STN International  
Marketing, Dept. 33886  
2540 Olentangy River Road  
P. O. Box 02228  
Columbus, Ohio 43202 USA**





# R&D Policies, Budgets, and Economic Competitiveness

## Twelfth Annual AAAS Colloquium on R&D Policy

9 & 10 April 1987

Capital Hilton ♦ Washington, DC

- ♦ Discussion will be based on *AAAS Report XII: Research and Development, FY 1988*, a timely and comprehensive analysis of the proposals for R&D in the FY 1988 budget, prepared by AAAS and a group of its affiliated scientific, engineering, and higher education associations.
- ♦ Trends and prospects for R&D in defense, energy, health, space, and other areas will be explored by leaders from industry, universities, agencies of the federal government, Congress, the White House, and the scientific and engineering communities.
- ♦ Perspectives will be provided on topics such as budget deficit targets and their impacts on R&D, Japanese science and technology policy, U.S. economic competitiveness and the role of science and technology, "big science" programs and priorities in science, impacts of defense R&D budgets on the U.S. scientific-technical system.
- ♦ Registrants will also receive *Proceedings* following the Colloquium and *Congressional Action on R&D in the FY 1988 Budget* in the fall.

**For further details, write:** AAAS R&D Colloquium, Public Sector Programs, 1333 H Street, NW, Washington, DC 20005.

Sponsored by the AAAS Committee on Science,  
Engineering, and Public Policy

**American Association for the Advancement of Science**



**12th AAAS R&D Colloquium**  
**Washington, D.C.**  
**9-10 April 1987**

**ADVANCE  
REGISTRATION  
FORM  
S1**

The Capital Hilton, 16th & K Streets, N.W., Washington, D.C.

Please Type or Print Clearly

Name \_\_\_\_\_  
(last) (first and initial)

Affiliation \_\_\_\_\_

Mailing Address \_\_\_\_\_  
(street and number)

\_\_\_\_\_  
(city) (state and zip) (telephone number)

☐ Check enclosed or charge to my ☐ VISA or ☐ MASTERCARD

Card No. \_\_\_\_\_ Expiration Date \_\_\_\_\_

Cardholder's signature \_\_\_\_\_

☐ Check here if you need special services due to a handicap. We will contact you before the meeting.

**REGISTRATION FEES**

\$170 Full (meals and publications) \$ \_\_\_\_\_

\$125 Partial (publications only) \_\_\_\_\_

\$ 60 Student (publications only) \_\_\_\_\_

**SEPARATE MEAL TICKETS**

\$ 22 Lunch, Thursday (9 Apr.) \_\_\_\_\_

\$ 8 Breakfast, Friday (10 Apr.) \_\_\_\_\_

\$ 22 Lunch, Friday (10 Apr.) \_\_\_\_\_

**TOTAL AMOUNT:** \$ \_\_\_\_\_

Packets will be mailed to preregistrants on about 23 March; registrations received after 23 March will be held at the AAAS Registration Desk in the Capital Hilton. **Refund Policy:** Advance registration fees and meal tickets will be refunded for cancellations received by 3 April; no refunds will be made on cancellations received after this date.

Registration fees include all sessions and publications; meals are included only with payment of full registration fee. All registrants receive *AAAS Report XII: Research and Development, FY 1988* before or at the Colloquium, published *Proceedings* after the meeting, and a supplementary report, *Congressional Action on R&D in the FY 1988 Budget*, in the fall.

**Mail registration form to:** AAAS Meetings, R&D Forum Registration, 1333 H Street, N.W., Washington, D.C. 20005

**Capital Hilton Hotel Reservation**  
**AAAS R&D Colloquium ♦ 9-10 April 1987**

(Reservations received after 13 March cannot be guaranteed)

**Send confirmation to:**

Name \_\_\_\_\_ Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_ Telephone No. \_\_\_\_\_

**Other occupants of room:** Name \_\_\_\_\_ Name \_\_\_\_\_

**Room:** ☐ Single (\$115)\* ☐ Double (\$135)\* ☐ Twin (\$135)\* \*Add 10% D.C. sales tax and \$1 occupancy tax.

**Arrival:** Date \_\_\_\_\_ Time \_\_\_\_\_ **Departure:** Date \_\_\_\_\_ Time \_\_\_\_\_

Be sure to list definite arrival and departure time. Check-in time is 3:00 p.m.; check-out time is 12 noon.

**Special housing needs due to handicap** \_\_\_\_\_

Enclose separate check, made out to **The Capital Hilton**, for first night's room deposit or provide major credit card information:

Credit Card Name \_\_\_\_\_ Number \_\_\_\_\_ Expiration Date \_\_\_\_\_

Cardholder's signature \_\_\_\_\_

**Mail hotel reservation form to:** Reservations, The Capital Hilton, 16th & K Streets, N.W., Washington, D.C. 20036