American Association for the Advancement of Science

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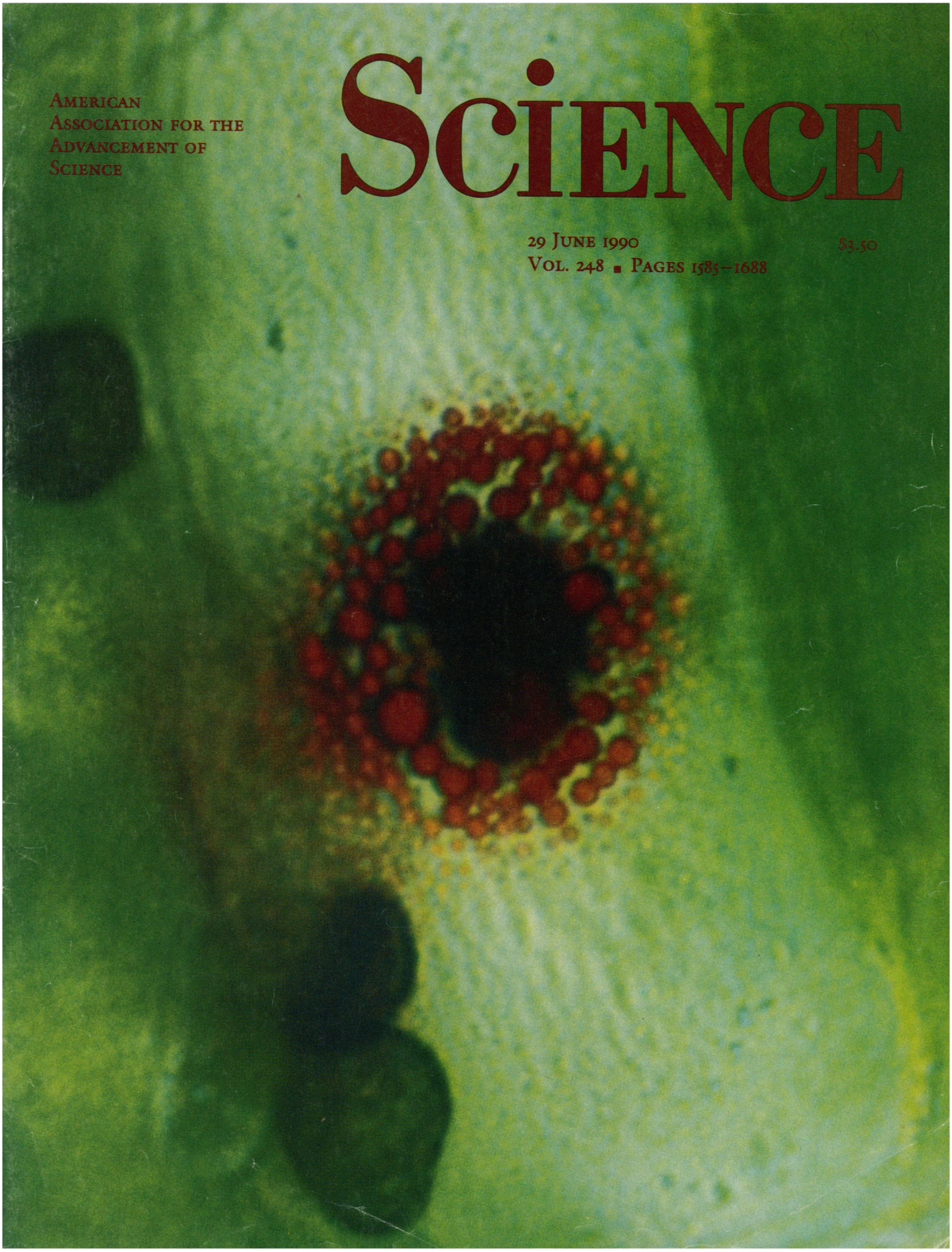

Helmut Horten Foundation

Madonna del Piano, June 1990

Nominations for the 1991 Helmut Horten Research Award

In autumn 1991, the Helmut Horten Foundation will, for the first time, award a scientist, or a group of scientists working on a common project, the Helmut Horten Research Award amounting to SFR 1,0 million (approximately US$ 700.000.–). This amount includes a sum to be given to the laureate for his discretionary use together with funds destined to support of his or her research in the field of basic, clinical or applied sciences. The award will be granted bi-annually on a worldwide basis.

The award intends to honor achievements and to encourage further research in the field of medicine or biology of benefit to human health. Such achievements could include seminal scientific contributions to the basic biomedical sciences, epidemology, parasitology, or to disease eradication efforts.

The award-winner will be selected by a committee composed of internationally prominent scientists.

Readers are invited to assist in nominating candidates for the Helmut Horten Research Award. The following should be noted:

1. Nominees should be proposed by scientists, physicians and institutions having detailed knowledge of the candidates' research.
2. Nominations submitted by candidates themselves cannot be considered.
3. Nominations must be made on an official form obtainable, togheter with further information, from:
   The secretary of the Selection Committee
   Foundation Helmut Horten
   CH-6995 Madonna del Piano
   Switzerland
4. The deadline for nominations is November 15, 1990.

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

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■ The American Association for the Advancement of Science was founded in 1848 and incorporated in 1874. Its objectives 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, to advance education in science, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress.

COVER A view of the localized phytoalexin response of a single epidermal cell of *Sorghum bicolor* to the phytopathogen *Colletotrichum graminicola*. The response is characterized by the accumulation of phytoalexins in cytoplasmic inclusions that enlarge as they move toward the fungal infection structure, releasing their contents and restricting the growth of the pathogen. See page 1637. [Photograph by Ralph L. Nicholson]

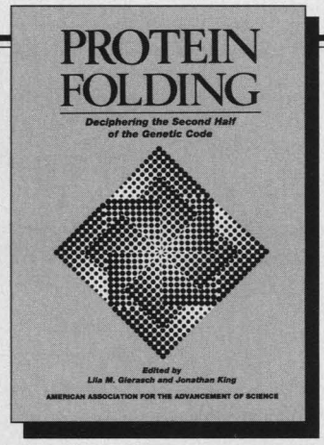
Reports

Book Reviews

Author Index to volume 248 is found on pages I–X

Information for Contributors is found on pages XI–XII

New from AAAS



Protein Folding

Deciphering the Second Half of the Genetic Code

Edited by Lila M. Gierasch and Jonathan King

This volume explores new experimental techniques and discoveries that are dramatically enlarging our understanding of the process of protein folding. Based on a seminar at the AAAS Annual Meeting, the book emphasizes new interactions between theory and experiment and looks closely at the process of tailoring proteins and their fragments for the testing of folding hypotheses. It is especially valuable to researchers in the biotechnology industry and to those involved in interpreting the growing data base of DNA sequences.

1990; 352 pp.; index
***#89-18S** - softcover; $39.50*
(AAAS members $31.50)

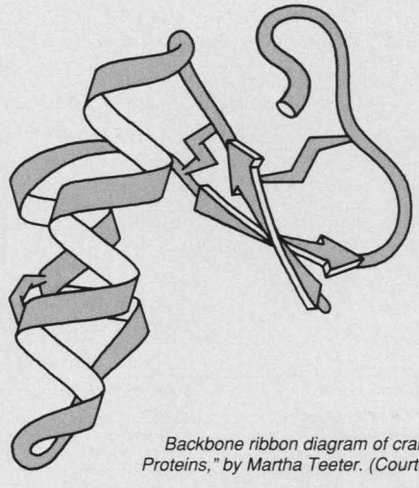
Contents:

I. Structural themes in native proteins: Origami of proteins; loops in globular proteins; helix signals in proteins; the water structure surrounding proteins; higher-order structure in fibrous proteins; an hydration-mediated free energy driving force for protein folding and assembly.

II. Interactions and conformations of amino acids in peptides: Peptide conformations in crystals; α-helix formation by short peptides in water; folding of peptide fragments in water; structure-function relationships in lipid-protein interactions.

III. Recovering active proteins: Expression and stabilization of bovine pancreatic trypsin inhibitor folding mutants in *E. coli;* design, synthesis, and characterization of a protein folding intermediate analogue; folding of bovine growth hormone; inclusion bodies from proteins produced at high levels in *E. coli;* folding of a multidomain oligomeric protein: the beta subunit of *E. coli* tryptophan synthase.

IV. Intermediates in protein folding: Understanding folding pathways and mechanisms; de novo design of helical proteins; possible intermediates in the unfolding transition of two-chain, coiled-coil proteins; the alpha subunit of tryptophan synthase: probing the multistate folding mechanism by mutagenesis; proline isomerization and folding of yeast cytochrome c.



Backbone ribbon diagram of crambin, from the chapter, "The Water Structure Surrounding Proteins," by Martha Teeter. (Courtesy of Jane Richardson; modifications by Marc Whitlow.)

V. Protein folding within the cell: Conformations and interactions of signal peptides: elucidating the role of signal sequence in protein secretion; modulation of folding pathways of exported proteins by leader sequence; identification of amino acid sequences influencing intracellular folding pathways using temperature sensitive folding mutations; folding of collagen molecules containing mutant chains.

VI. Modeling protein folding and structure: Theoretical studies of protein structure; polypeptide segment prediction using conformational search; supercomputing opportunities for protein sciences; diffusion-collision model of protein folding.

VII. Protein design: what can we get away with? Diacylaminoepindolidiones as templates for β-sheets; engineering enzyme specificity by "substrate-assisted catalysis"; the use of gene fusions to study membrane protein topology.

Order from: AAAS Books, Dept. SM, P.O. Box 753, Waldorf, MD 20604 (FAX: 301-843-0159). To order by phone (VISA/MasterCard orders only), call 301-645-5643 (9am-4pm ET) and ask for AAAS. Individuals must prepay or use VISA/MasterCard. For institutional purchase orders, add $3.50 postage & handling. Please specify item #89-18S, and allow 2-3 weeks for delivery. For shipments to California, add applicable sales tax.

American Association for the Advancement of Science

Going to seed

THE "fitness" of wild radish pollen with respect to the siring of seeds depends on the environment in which the pollen was produced (page 1631). More seeds are generated when pollen comes from a plant that was nutritionally enriched than when it comes from a plant that was nutritionally deprived. Paternal inheritance in wild radish flowers is easy to score, because a single gene locus with just two alleles determines whether the color of the petals will be yellow or white. Young and Stanton observed that other aspects of seed function were not altered by nutrition in the pollen-producing plant: both the number of days it took for seeds to germinate and the number of days it took for plants to flower were equivalent in plants growing from the two types of pollen. Interestingly, the deficiency of stressed pollen was only apparent in competition experiments in which pollens from normal and from stressed sources were placed together on a plant's stigma; in noncompetition assays, stressed pollen sired as many seeds as did nonstressed pollen. Paternal environment is therefore another variable that must be added to the equation of plant reproductive success, an equation that also considers maternal environment, growth environment, and complex genetic factors.

Seeing the light

VISION depends on communication between photoreceptor cells in the eye and the retinal pigment epithelium. The two are connected by an interphotoreceptor matrix that surrounds the photoreceptor cells and links them to the epithelium. Ions, water, metabolites, and other substances move through this matrix and bring about communications that are thought to be key to correct processing of visual cues. Studies by Uehara *et al.* show that the distribution of substances in the interphotoreceptor matrix is fairly uniform in the eyes of rats that have been kept in the dark; however, the transition from dark to light triggers changes that give the interphotoreceptor matrix a banded pattern (page 1633). The banding occurs rapidly (within 5 minutes) whereas the return to uniformity when darkness is imposed takes longer (a matter of hours). It is likely that the gross structural changes seen correspond to conformation changes in or a redistribution of proteoglycans and acidic glycoproteins that facilitate the shuttling or diffusion of substances through the matrix.

Phytoalexin kinetics

INTEREST in naturally occurring substances that protect plants from infectious microbes has been increasing, particularly as awareness has grown of the mixed blessings of commercial chemical pesticides. Among the plant products that have natural antifungal properties are the phytoalexins. Sorghum plants that are susceptible to the fungal disease anthracnose make phytoalexins, and because these substances are pigmented they can be studied in infected tissues with various visualization techniques (cover). Snyder and Nicholson observed that cells under direct attack by the fungus developed intracellular organelles that moved toward the fungal penetration site (page 1637). The organelles were clear at first, but as they approached the entry site their pigmentation intensified. After pigments were released into the cytoplasm, they accumulated in and killed the fungi. This system is well suited for studies of pathogenesis and the regulation and expression of genes that aid in plant resistance. As more is known about this plant-microbe interaction, it may be possible to control anthracnose, a disease that exacts an especially heavy toll in semiarid regions where sorghum is a dietary staple.

Factor in tumorigenesis

WHEN chickens are infected with the Rous sarcoma virus they develop tumors at the injection site and also at sites where wounds have been inflicted with silk suturing thread. Something about the wound or about the healing process apparently alters local tissue and makes it vulnerable to tumor growth. A study by Sieweke *et al.* shows that transforming growth factor–β (TGF-β) is one important component of the host's response that enhances wound-associated tumorigenesis (page 1656). TGF-β is secreted by macrophages and granulocytes, two types of cells that are attracted to wounded tissues. The time course for the appearance of natural TGF-β after wounding, its localization to wound sites, and the dose dependence of tumor growth when recombinant TGF-β is applied are consistent with a mediator role for TGF-β in tumorigenesis during healing rather than with a role for this factor merely as an innocent bystander. The pleiotropic effects of TGF-β in host tissue, which include helping to reorganize recovering tissues after wounding and promoting the growth of experimental tumors, may result from the factor's diverse molecular actions on different types of cells.

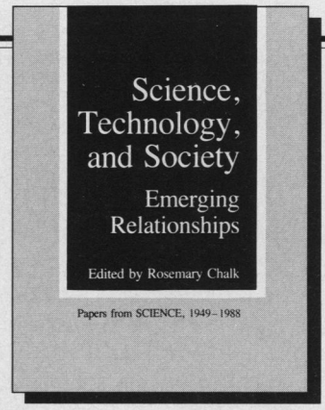
Neurotransmitting vasoconstrictor

ENDOTHELIN is a powerful vasoconstrictor that at first could only be detected in the bloodstream; more recently, it has been found in the spinal cord and brain. In the nervous system, endothelin appears to act as a neuropeptide, stimulating the release of gonadotropin from anterior pituitary cells (page 1663). Stojilković *et al.* found that endothelin was as potent an inducer of gonadotropin, luteinizing hormone, and follicle-stimulating hormone as the brain's gonadotropin-releasing hormone itself. Like gonadotropin-releasing hormone, endothelin mobilized calcium ions that in turn stimulated the release of the pituitary hormones. Endothelin and gonadotropin-releasing hormone appear to bind to different surface receptors on pituitary cells but then to use the same second messenger system for transducing the signals that bring about hormone secretion.

■ RUTH LEVY GUYER

Science & Society

Books from AAAS



Science, Technology, and Society

Emerging Relationships

Edited by Rosemary Chalk

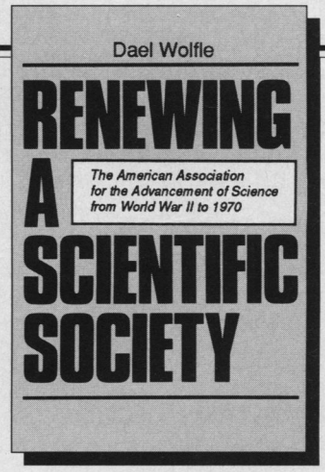
This volume provides a thorough introduction to the issues concerning the unique relationships among science, technology, and society (STS). It offers 85 articles, editorials, and letters published over the past 40 years in *Science*, the weekly journal of the AAAS.

The material provides a broad overview of the emerging relationships of science, technology, and society in the period after World War II. Contributors include Bertrand Russell, C.P. Snow, Pope John Paul II, and many scholars well known in the scientific literature. The collection reflects a variety of perspectives on science, technology, and society. Provocative essays capture the concerns of leaders in the scientific community who sought to articulate the pressing problems of their times.

The book is a valuable resource for those with a professional interest in STS studies. It is also designed for use as a supplemental text for college or high school courses examining the social context of STS. And it is of interest to lay readers who want to gain an insight into the purposes and values that shape the directions of science.

Topics include: Scientific responsibility; science and freedom; science and ethics; the human side of science; scientists and citizens; science and the modern world; fraud and misconduct in science; professional rights and duties in the health sciences; science and risk; and science and national security.

1989; 262 pp.; softcover; index
***#88-12S** - $19.95 (members $15.95)*



Renewing a Scientific Society

The American Association for the Advancement of Science from World War II to 1970

Dael Wolfle

Dael Wolfle was executive officer of AAAS during the post-war period that saw an unprecedented growth in American science. In this clear and engaging narrative, he describes the Association's role in that growth as well as its internal changes as it sought to serve its four key constituencies: scientists working in all fields of science and technology, students seeking careers in those fields, a public that increasingly needed to understand new technological advances, and opinion leaders whose decisions could influence scientific and technological activities.

Dr. Wolfle also describes the AAAS's work on a wide range of national issues, including development of the National Science Foundation; Cold War concerns about the loyalty and freedom of scientists; questions about the ownership and control of research; efforts to develop an effective science curriculum for all Americans; and issues regarding air conservation, the use of arid lands, the effects of herbicides in Vietnam, and much more.

This book is essential for historians of science, members of scholarly organizations, and everyone who wants to understand the inner workings of a major scientific society.

346 pp.; softcover; index
***#89-14S** - $24.95 (members $19.95)*

Order from: AAAS Books, Dept. SM, PO Box 753, Waldorf, MD 20604. Individuals must prepay or use VISA/MasterCard. AAAS will pay postage on prepaid or credit card orders; for institutional purchase orders add $3.50 postage & handling. Please specify publication number(s) and allow 2-3 weeks for delivery. For shipments to California, add applicable sales tax.

American Association for the Advancement of Science

REFERENCE REAGENTS FOR HUMAN CYTOKINES

The Biological Response Modifiers Program (NCI), the Division of Microbiology and Infectious Diseases (NIAID), and the National Institute for Biological Standards and Control (United Kingdom) have made available reference reagents for human cytokines. The reagents are available in small amounts (approx. 1µg/ sample) for use in the calibration of *in vitro* assays and in-house standards only.

REFERENCE REAGENTS CURRENTLY AVAILABLE:

IFN-α	IL-4
IFN-ß	IL-6
IFN-γ	G-CSF
IL-1α	GM-CSF
IL-1ß	M-CSF
IL-2	TGF-ß
IL-3	TNF-α

To Obtain These Reagents, Contact:

Dr. Craig W. Reynolds
Biological Response
Modifiers Program
NCI-FCRDC
Building 1052, Room 253
Frederick, MD 21701-1013

Shipments will be made collect express. Please allow 3 to 4 weeks for delivery.

National Cancer Institute —
Frederick Cancer Research Facility

BIOLOGICALS AVAILABLE FROM THE NATIONAL CANCER INSTITUTE (NCI)

The repository of the Biological Response Modifiers Program (BRMP), Division of Cancer Treatment (DCT), NCI, NIH, announces the availability of recombinant human lymphokines IL-1α, IL-1ß and IL-2 and the monoclonal antibodies 11B.11, against mouse IL-4 and 3ƵD, against human IL-1α.

Use of these materials is limited solely to *in vivo* and *in vitro* basic research studies and is not intended for administration to humans. The lymphokine materials are aliquoted in 100 µg amounts and are available to investigators with peer-reviewed support. However, manufacturers' restrictions prohibit distribution of these materials to for-profit institutions or commercial establishments.

The monoclonal antibodies are available to peer-reviewed investigators, for-profit institutions or commercial establishments. The 11B.11 antibody is available in either 3 or 50 mg vials. The 3ƵD antibody is available in 5 or 20 mg amounts.

Investigators wishing to obtain any of these materials should send requests to:

Dr. Craig W. Reynolds
Biological Response
Modifiers Program
NCI-FCRDC
Building 1052, Room 253
Frederick, MD 21701-1013

All requests should be accompanied by:

(1) A brief paragraph outlining the purpose for which materials are to be used, (2) the amount desired, (3) description of investigator's peer-reviewed support. Recipients will be required to sign a Materials Transfer Agreement and to pay shipping and handling costs. Please allow 4 to 6 weeks for delivery.

National Cancer Institute —
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