OXIDATIVE STRESS-INDUCED CATARACT

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Official Publication of the Federation of American Societies for Experimental Biology
September 1995, Volume 9, Number 12
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The Wood/Whelan IUBMB and ICSU Research Fellowships are designed to support young biochemists who need to travel to other laboratories in the IUBMB/ICSU region for the purpose of carrying out experiments requiring special techniques or for other forms of scientific collaboration or advanced training.

Conditions of Fellowships
The fellowships will be awarded for periods of 1-4 months. A fellowship is intended to cover the travel cost based on economy or similar fares (no more than US $ 1500) and to provide money for incidental expenses. It does not cover living expenses or insurance at the visited laboratory.

Recipients of the fellowships are required to make a full declaration to IUBMB/ICSU of all other support received in connection with the proposed visit. IUBMB/ICSU fellowships cannot be used to supplement scientific visits otherwise fully covered. Fellowships will not be awarded to attend courses, symposia, meetings or congresses.

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Applications should be sent in triplicate with the following documents:

(A) A research proposal of about two pages indicating clearly: (1) the nature of the project and the type of experiments to be carried out; (2) why it is necessary to travel to a particular laboratory to conduct the experiments rather than to perform them in the applicant’s own laboratory or simply to ship the materials; (3) why the project will require the particular time period requested.

(B) A short curriculum vitae of the applicant with a list of publications.

(C) A letter of acceptance from the head of the receiving institute signed by the leader of the group which will receive the recipient.

(D) A letter of recommendation from the head of the department of the applicant’s institution indicating the reasons why the fellowship would be beneficial. This letter should also list all other fellowships previously received by the applicant, especially for travel abroad to attend meetings or to study at another institution.

Application should be sent to
Dr. A. Kotyk, Institute of Physiology, CzAcadSci,
14220 Prague 4, Czech Republic, Fax: +422-4712253 or to
Dr. Horst Kleinkauf, Institute of Biochemistry and Molecular Biology,
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Applications can be submitted at any time; they will be reviewed every June and December.
Articles in Next Month’s Issue

Serial Reviews

Flavoprotein structure and mechanism 6. Mechanism and structure of thiorerodoxin reductase from Escherichia coli. C. H. Williams, Jr.


State-of-the-art Reviews


Regulation of cellular calcium through signaling cross-talk involves an intricate interplay between the actions of receptors, G-proteins, and second messengers. F. L. Bygrave and H. R. Roberts

The purification of membranes by affinity partitioning. A. Persson Molecular mechanisms and therapeutic strategies related to nitric oxide. S. Moncada and E. A. Higgs


Ras target proteins in eukaryotic cells. M. S. Marshall

original communications or proposals for reviews, prepared as described in the information for Authors (see volume 9, no. 1), should be sent to the Editor-in-Chief, Dr. W. J. Whelan, The FASEB Journal, 9623, P.O. Box 08129, Miami, FL 33165-0129, USA, or to a private courier is used, to the University of Miami School of Medicine, Gaultier Building, Room 317, 1111 N.W. 16th Street, Miami, FL 33132-1209, USA.

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COVER: Stereoscopic beam images of a 50-year-old normal male lens (upper left) and a 75-year-old male lens with extensive anterior and posterior cortical involvement (lower right) illustrate the hypothesis that H2O2 is a primary initiating factor in the development of cataracts. (Photograph by L. T. Chervinsky, W. K. Tung, and E. A. Bur. Harvard Medical School, Center for Ophthalmic Research, Brigham and Women’s Hospital, Boston, Mass.) See Spectro, pages 1173-1182

INVICTA STRESS-INDUCED CATARACT

H2O2?

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This is a civil service position in the Senior Executive Service (salary range is $97,991 - $122,040). Mandatory qualifications include familiarity with NIH and PHS scientific review, the ability to make program decisions based on national and organizational goals and values, and the ability to design human resource strategies to meet those goals. For vacancy announcement with complete qualification requirements call 301-496-1443. **Applications must be postmarked by November 1, 1995.**

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welcomes

The Protein Society

On September 1, 1995, The Protein Society became the 10th member of the Federation of American Societies for Experimental Biology (FASEB). The Protein Society was founded as an international organization in 1986, and has grown to a membership approaching 3,000. The organization has made a strong impact on the advancements of protein science, and members interact to exchange findings in the research of chemical structure, cellular function, and regulation of diverse proteins.

On behalf of the Federation Board, Executive Officers, the FASEB Executive Director and staff, we congratulate and welcome The Protein Society to the coalition that serves to contribute and advance the progress of biomedical research.
RESEARCH

Scientists who studied the gene that allows MAD to use a virus to carry this into human brain cancer cells. As a result, the cancerous cells were almost always prevented from forming tumors [Nature Medicine (1995) 1, 638–643]

Anatomy. An optical disk for CD-ROM players, A.D.A.M. Standard, allows the user to examine the male and female anatomy from anterior, posterior, medical, and lateral views; dissect more than 250 layers of realistic anatomical illustrations with the click of a mouse; point anywhere on the anatomy to view more than 18,000 structure identifications, and more. The program is designed for 2- and 4-year college programs, including pre-med and allied health. For more information, write to A.D.A.M. Software Inc., 1600 Riveredge Parkway, Ste. 800, Atlanta, GA 30328, USA, or call 404-980-0888.

Proteins that play a major role in the growth and development of fly and possibly mammalian embryos, including those of humans, are controlled by warning signals that keep each other in check. [Nature (1955) 376, 699–702] The discovery of this previously unknown mechanism may lead to new approaches in the regulation of cell division.

ISSUES

One way to counter the reduction in funds for biomedical research that is anticipated between 1996 and 2002—the year the deficit will be under control according to Republican plans—is to remove some of the regulations that the government has placed on science in the last 10 years. Toward this end, Rep. John E. Porter (R-Ill.) has asked the General Accounting Office to assess how much the government and universities spend each year on these regulations, which target waste disposal, care and feeding of animals, and administrative and cost-accounting requirements. According to an article in The Chronicle of Higher Education (August 11, 1995, A25), many biomedical scientists support Mr. Porter’s view, citing for example, exorbitant auditing costs that ensure regulations are being adhered to. On the other side of the issue, many researchers point to the need for regulations to ensure accountability and research ethicists cite the recent history of abuses when scientists have been allowed to police themselves. In addition, female lawmakers believe that such regulations are necessary in order to force clinical researchers to include women and minorities in their studies.

A state district court has ruled that the University of Minnesota must make public the agendas and minutes of the University Animal Care Committee, which oversees animal research at the university. The judge also ruled, however, that the sections the university claims hold trade secrets do not have to be revealed. The Animal Rights Coalition, which brought the suit, wanted the records made public because of the potential for discovering abuses of animals at the university even though the coalition had no evidence of such problems there.

“Research in Genetics and Criminal Behavior: Scientific Issues, Social and Political Implications” is the new title of a conference that was cancelled 3 years ago at the University of Maryland because of the racially charged atmosphere following the Los Angeles riots. Funds provided for that aborted conference, “Genetic Factors in Crime: Findings, Uses, and Implications,” were released recently to make way for the new conference, which will convene September 22-24, 1995, in Queenstown, MD.

AWARDS/PROGRAMS

The National Science Foundation has awarded $10 million to spur reform of undergraduate curricula in chemistry at four higher education coalitions around the country. The grants comprise the first round of full awards in the Systemic Changes in the Undergraduate Chemistry Curriculum program. The grants will be distributed over the next 5 years to The University of Wisconsin at Madison and the City College Consortium at the City University of New York. In addition, the ChemLinks Coalition, led by Beloit College, will cooperate with the ModularChem consortium, led by the University of California at Berkeley.

Merck & Co. is donating $20 million to the United Negro College Fund to support black students pursuing careers in scientific research.

The National Research Council (NRC) is seeking applicants for its 1996 Resident, Cooperative, and Postdoctoral Research Associateship programs, which provide opportunities for Ph.D. scientists and engineers of "unusual promise and ability" to conduct research of their own choosing in chemistry, life and medical science, mathematics, applied science, and other areas. Most of the programs are open to U.S. and non-U.S. nationals, and to both recent doctoral recipients and senior investigators. Obtain more information by writing to the NRC, Associateship Programs (TJ2094/D3), 2101 Constitution Ave., NW, Washington, DC 20418, USA.

The NRC is also seeking candidates for Travel/Host Grants for American Scientists from individual American specialists who plan to establish new research partnerships with their colleagues from Central/Eastern Europe (CEE) and the Newly Independent States (NIS). The program is designed primarily to prepare these new partnerships for competition in National Science Foundation programs. For applications, write to the NRC at the address above or call 202-334-3680; e-mail OCEE@NAS.EDU; or fax 202-334-2614.

Among the five grants totaling $3.45 million from the W.M. Keck Foundation are $1 million to the University of Utah’s
Institute of Human Genetics for its program in molecular biology and genetics; $750,000 to the University of California at Berkeley for biomedical research in immunology and genetics, and $500,000 to the University of Colorado at Boulder to advance research by the Department of Molecular, Cellular and Developmental Biology's mammalian biology program.

BROCHURE
The U.S. Department of Health & Human Services has warned that the bacterium Vibrio vulnificus, which occurs naturally in marine waters and is found in raw oysters, can seriously affect individuals who have liver disease, diabet es, and other medical conditions. The Food and Drug Administration has issued a brochure designed to inform people who are at risk about the dangers of eating raw oysters. Call the FDA's Seafood Hotline (1-800-332-4010) for a free copy of the brochure [DHHS Publication No. (FDA) 95-2293] and more information about Vibrio vulnificus.

COMMUNICATIONS CAPSULES
The following are summaries of original research articles that appear in this issue.

MELATONIN AS A NEURAL ANTIOXIDANT
The pineal hormone melatonin is a potent antioxidant and free radical scavenger. The brain is highly susceptible to free radical damage because 1) it uses large quantities of oxygen, from which damaging free radicals are generated, and 2) because the brain contains large amounts of polyunsaturated fatty acids that are readily oxidized by free radicals. Melchiorri et al. (pages 1205–1210) demonstrate that treatment of homogenates from several brain areas (cerebrum, cerebellum, hippocampus, hypothalamus, and striatum) with melatonin markedly reduces free radical damage to brain lipids induced by kainate. Since it readily enters the brain in vivo, melatonin may protect the CNS from oxidative stress.

BASIC FGF INHIBITS CELL GROWTH
The growth of a human nasopharyngeal carcinoma cell line (CG-1) in culture is stimulated and inhibited by aFGF and bFGF, respectively, within the same dose range (Chen et al., pages 1211–1219). Both factors bind to cell surface high-affinity sites, and only the bFGF binding is dependent on cell surface heparin-like molecules. The inhibitory effect of bFGF is mediated via FGFR-1 and is dependent on its high-affinity binding to CG-1 cells. The results show that bFGF can act as a negative growth modulator for non-neuronal cells.

ARTIFICIAL CYTOTOXIC CONJUGATES
Chemical cross-linking of transferrin (Tf) and saporin (a plant toxin) yields a covalent complex that may be particularly effective against cells over-expressing the Tf-receptor (Ippoliti et al., pages 1220–1225). Endocytosis and intracellular routing of the chimera complex follow the Tf-receptor cycle and differ from other plant toxins such as ricin. The potential use of these chimeric toxins for cancer therapy requires a detailed knowledge of the respective role of the toxin and its carrier, overall toxicity being affected by the intracellular pathway.

HISTIDYL-tRNA SYNTHETASE'S AUTOANTIGENIC EPITOPES
The most frequently found myositis-specific antibody, the anti-Jo-1 antibody, binds to histidyl-tRNA synthetase (HRS). It is unclear, however, whether HRS is the stimulating antigen or is merely a protein that crossreacts with a yet undefined antigen. As antibody directed against an unrelated antigen would not be expected to crossreact with HRS at multiple sites, Martin et al. (pages 1226–1233), chose to map the epitopes on HRS to resolve this issue. They report that 18 patients sera react to a minimum of three epitopes on HRS, indicating that the immunological response is directed against HRS and not a cross-reactive antigen.