ACUTE HYPOXIC PULMONARY VASOCONSTRICTION

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State-of-the-art Reviews

Astrocytes in glutamate neurotransmission: receptor-mediated regulation of glutamate uptake carriers, ion channels, and cell volume. E. Hansson and L. Ronnback


Ionic basis of the electrophysiological actions of adenosine on cardiomyocytes. L. Belardinelli, J. C. Shroyock, Y. Song, D. Wang, and M. Saffitz

The role of chaperones in the biogenesis and maintenance of the mitochondrial. R. D. Martinus, M. T. Ryan, D. J. Naylor, S. M. Herd, N. J. Hoogenraad, and P. B. Huj


Serial Reviews

Protein kinases 4. Protein kinases CK2: an enzyme with multiple substrates and a puzzling regulation. J. E. Allende and C. C. Allende


Protein motifs 3. The parallel beta helix and other coiled folds. M. D. Yoder and F. Jurnak

COVER: An ensemble of experiments by several groups, which show that hypoxic pulmonary vasoconstriction occurs in single smooth muscle cells, is in part dependent on calcium influx through voltage-dependent channels, is preceded by a drop in chemiluminescence (a measure of oxygen radical production), and is initiated by hypoxia inhibition of outward potassium current, which causes membrane depolarization. (Computer graphics by V. Hampi, PhD.) See War and Archer; pages 183-185.

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306-547-8266
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The Federation of American Societies for Experimental Biology (FASEB) seeks an Editor-in-Chief of The FASEB Journal. The first and current Editor-in-Chief, Dr. William J. Whelan, plans to retire from this position in June 1996 after 10 years of distinguished service.

The Federation of American Societies for Experimental Biology (FASEB) is a coalition of nine biomedical research societies in the disciplines of physiology, biochemistry and molecular biology, pharmacology and experimental therapeutics, investigative pathology, nutrition, immunology, cell biology, biophysics, and anatomy. The FASEB Journal is an official publication of the Federation designed to report on rapidly changing developments in the life sciences, and publishes state-of-the-art reviews and brief research communications in areas of interest to members of the FASEB Societies. Reviews focus on interdisciplinary aspects of growth points in life sciences research, and research communications emphasize innovative advances in methodology. In addition, the Journal features articles on public affairs and news items about research funding; people and institutions; a calendar of scientific meetings; and lists of currently released books and new products.

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Closing date for receipt of applications is April 15, 1995.

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1995 FASEB SUMMER


RESEARCH

Researchers have found that electric utility workers exposed to high levels of magnetic radiation face a greater risk of dying from brain cancer than workers exposed to lower levels. No general association was found between exposure to the radiation and deaths from leukemia. [Am. J. Epidemiol. (1995) 141, 123] Both findings differed from those of other recent studies, which have found a significant risk of leukemia in people exposed to magnetic fields but a weaker association between exposure to the fields and brain cancer.

New findings indicate that HIV attacks the immune system at a much greater rate than previously thought, with millions of new virus particles produced daily and millions killed. But the immune system's losses are also great, with up to one billion infected cells dying and being replaced daily and with the immune system losing a little each day. [Nature (1995) 373, 123]

Recent experiments reveal how the ion channel receptor for the neurotransmitter acetylcholine opens and closes. [Nature (1995) 373, 37]

Researchers have developed a sensitive sensor system that uses capillary electrophoresis to separate components of a mixture and single cells as sensors for detecting chemical species. [Science (1995) 267, 74]

AIDS has become the leading cause of death among all Americans aged 25-44. For women, AIDS is now the leading cause of death in 15 of the 135 largest cities (Hartford, New Haven, and Bridgeport, Conn., Worcester, Mass., Providence, R.I., New York City and Yonkers, NY, Elizabeth, Jersey City, Newark, and Paterson, N.J., Baltimore, Md., Columbia, S.C., Fort Lauderdale and Miami, Fla.). Although the epidemic seems to have stabilized among homosexual men in some areas of the country, there is evidence of a future second wave in that group, according to the Federal Centers for Disease Control and Prevention (CDCP), which conducted the study. The CDCP cited recent studies in San Francisco, Denver, and Chicago showing an incidence of 2 to 3 percent a year for new infections in gay men.

AWARDS

Sir Aaron Klug, F.R.S., Nobel Laureate, and director of the Medical Research Council Laboratory of Molecular Biology, Cambridge, U.K., will be recommended by the Council of the Royal Society of London to become the society's next president, beginning November 30, 1995, for a 5-year term. "Zinc Fingers," a review by Sir Aaron and J.W.R. Schwabe, will be published as part of the Protein Motifs series in the May 1995 issue of The FASEB Journal.

Peter G. Schultz (ASBMB), chemistry professor, University of California, Berkeley, and Richard A. Lerner, president of Scripps Research Institute, have been awarded the Wolf Prize in Chemistry for 1994-95. The Israel-based Wolf Foundation awarded the two scientists the $100,000 prize "for their work in converting antibodies into enzymes, thus permitting the catalysis of chemical reactions considered impossible to achieve by classical chemical procedures." In 1986, Lerner and Schultz independently conceived and demonstrated that antibodies could selectively catalyze reactions. Since then, catalytic antibodies have been developed to catalyze a wide range of chemical and biochemical reactions. The prize will be presented in March 1995 by Israeli president Ezer Weizman.

The 1996-97 competition for the Fulbright Scholar Awards for U.S. Faculty and Professionals opens March 1, 1995. Opportunities are available in all disciplines and professional fields, both inside and outside academia, and include research scientists and individuals in the private sector and government. Deadline for lecturing or research grants is August 1, 1995. Other deadlines are set for special programs: distinguished Fulbright chairs in western Europe (May 1) and Fulbright seminars and academic administrator awards (November 1). Council for International Exchange of Scholars, 3007 Tilden St., NW, Suite 5M, Box GNEWS, Washington, DC 20008-3009; phone 202-686-7877; e-mail (application requests only): CIESI@CIESINET.CIES.ORG

WHAT'S AVAILABLE


The NIH National Institute on Aging (NIA) Aging Cell Repository has cell cultures from individuals with aging-related conditions including disorders of accelerated aging and cell cultures from familial Alzheimer disease-extended pedigrees. The repository also has human and animal-differentiated cell cultures, human mammmary epithelial and keratinocyte cell cultures, and fibroblast cultures from animals with different life spans. For a catalog of cell lines, contact the NIA Aging Cell Repository, Corell Cell Repositories, Coriell Institute for Medical Research, 401 Haddon Ave., Camden, NJ 08103, USA; phone 800-752-3805 (U.S.); 609-757-4848 (outside the U.S.); fax 609-757-9737.

Fish oil test materials are available free to help researchers evaluate omega-3 fatty acids in health and disease. The Fish Oil Test Materials Program, a cooperative effort of the National Institutes of Health and the National Oceanic and Atmospheric Administration/Department of Commerce, provides a long-term, consistent supply of quality-assured/quality-controlled test materials, which are available in both capsules and bulk. To receive the test materials, researchers must have peer-reviewed research indicating the need for the materials and submit an application. Write to the Fish Oils Test Materials Program, NIIAA, NIH, 12501 Washington Ave., Flow Bldg., Rm. 2, Rockville, MD 20852 or fax 301-594-0035 for an application form. Call Beth Aurecchia at 301-443-9643 for additional information.

IN MEMORIAM

Bernard L. Oser (ASPEF-R), a biochemist who is credited with alerting the food industry in the 1950s to the need for toxicological studies and safety evaluations, died January 21 at the age of 95. Oser was a founding member of the Institute of Food Technologies and frequently served on advisory panels of the National Research Council and the Expert Committee on Food Additives. His expertise in nutrition and toxicology helped move food science forward when there was growing concern over new additives and preservatives.
COMMUNICATIONS CAPSULES

The following are capsule summaries of research communications that appear in this issue.

ADVERSE EFFECT OF GLUCOSE ON RECOVERY FROM HEPATOTOXICANTS
Centrilobular hepatotoxicants, such as thioacetamide, cause extensive liver pathology in male Sprague-Dawley rats. Recovery from liver injury between 36 and 48 h is highly dependent on nutritional factors. Simultaneous treatment with palmitic acid and carnitine, for example, has an ameliorating effect (Chanda and Mehendale, FASEB J, in press). In the current study Chanda and Mehendale (pages 240–245) show that drinking water containing 15% glucose on the contrary inhibits cellular regeneration and tissue repair in the liver, thereby culminating in the death of the animals. The authors stress that the chosen nutritional regimen is of crucial importance in the treatment of acute liver injury.

GLUTATHIONE DISULFIDE LEVELS AND GENE EXPRESSION
HIV-infected individuals and SIV-infected macaques have, on the average, decreased cysteine and glutathione levels. Mihm et al. (pages 246–252) report the effects of cysteine and glutathione levels on the activity of the transcription factor NFkB that controls many immunologically important genes. The results show that increasing extracellular cysteine concentrations raise not only intracellular glutathione but also causes a more proportional increase in glutathione disulfide. This, in turn, inhibits the DNA binding and transactivating activity of NFkB. The study suggests that cysteine and glutathione deficiency may contribute to the observed overexpression of certain cytokine genes in HIV infection, and that the immune system may be sensitive not only to cysteine and glutathione deficiency but also to an excess of cysteine.

MORPHOGENESIS OF CALCITIC SKELETAL ELEMENTS
Biomineralization processes are governed by the secretion of specialized macromolecules that are introduced in the microenvironment of crystal growth and end up within the crystalline skeletal element itself. In a synchrotron X-ray diffraction study of the defect patterns produced by these macromolecules inside the crystals, Aizenberg et al. (pages 262–268) show that the exquisite morphologies of calcareous sponge spicules are determined not only by the shapes of the confined spaces in which they grow, but also by the assemblage of soluble proteins introduced into the crystal, and that this process is highly controlled.

PREVENTION OF HUMAN TIME STRUCTURE
Upon exposure to sustained and synchronized diurnal activity, most human variable exhibit rhythms with a 24-h period. The sequential array of the rhythms' phases constructs the human time structure. An analysis of rhythms of 168 different human variables revealed a time-dependent distribution of rhythms' peaks/h, with absence of any rhythm's peak 2 h around wakening time (Ticher et al., pages 269–272). Quantifying the ratio of each rhythm's amplitude/mean values yielded a five-modal distribution whose modes occurred at clock times where repetitive habitual signals are anticipated. It is suggested that these specific features optimize the adaptive value of human-time-structure and reflect on the integration of evolutionary processes and masking effects.

MUSCLE ENZYME AND COMPOSITION IN OBESITY
The relationship between insulin sensitivity, muscle composition, and glycolytic and oxidative enzymes were investigated by Simoneau et al. (pages 273–278) in lean and obese women. Obese women had muscle with lower computed tomography attenuation, insulin resistance, reduced oxidative enzyme activity but increased glycolytic capacity. The findings suggest that insulin-resistant muscle in obesity has reduced capacity for substrate oxidation and manifests increased fat storage.

IN SITU mRNA QUANTITATION
In situ hybridization allows one to obtain spatial and semi-quantitative information about mRNA levels for specific genes in tissue sections. A combination of quantitative autoradiographic and in situ hybridization techniques was employed by Wright et al. (pages 279–283) to monitor mRNA levels for ornithine decarboxylase, estrogen receptor, transforming growth factor-α, and glyceraldehyde-3-phosphate dehydrogenase in human breast tumor xenografts. Drugs like tamoxifen inhibit the growth of estrogen-receptor positive tumors through effects on the expression of genes that control cell proliferation. Comparisons of control and tamoxifen-treated animals show significant decreases in MCF-7 tumor estrogen receptor mRNA levels in the drug-treated animals. These techniques allow one to measure mRNA levels for genes that reflect the growth or differentiated state of tumors, and to monitor effector-induced changes in these mRNAs in vivo.