
BOOK REVIEWS

Annual Review of Pharmacology and Toxicology, vol. 29, 1989, pp. 543, (eds) Robert George and Ronald Okun (Published by Annual Reviews Inc, 4139 El Camino way, Palo Alto, California 94303-0897, USA) Price: USA \$34; Elsewhere \$38.

Annual Reviews has been doing a signal service to students of pharmacology and toxicology by highlighting, in some of the recent volumes, the achievements of pioneers in the field and the home and academic environment in which they worked. The volume under review carries a tribute to Bernard B. Brodie, the father of biochemical pharmacology. The period 1950-1970 witnessed an amazing array of discoveries in the Laboratory of Chemical Pharmacology of the National Heart Institute. Differential extraction of drugs and their metabolites by solvents of differing polarity was the principle Brodie used in perfecting analytical methods for drugs. This approach has contributed significantly to the speedy approval and release by regulatory agencies of drugs for human use. Another fundamental discovery was the role of mixed function oxidases or drug metabolizing enzymes, which are now of significance not only for drugs but all xenobiotics, including environmental pollutants. The studies conducted under Brodie's direction on the relationship between 5-hydroxy-tryptamine (serotonin) and reserpine led to the development of the new discipline of neurochemical pharmacology. The outcome was the uncovering of the role of monoamine oxidases and the discovery of drugs used extensively today in the treatment of depression, hypertension and cardiovascular ailments.

Granules located in the atria contain three important peptides. These peptides are released into circulation in a number of ways. The mechanism of atriopeptin regulation and function and atriopeptin receptors have been reviewed. Percutaneous absorption of drugs is critical for the efficacy of drugs applied to live human skin. Glucocorticosteroids play a key role in the release of drugs applied on the skin and transported by vehicles. There is much more to learn about penetration enhancers. Stratum corneum not only acts as a barrier but also as a reservoir of the drugs.

Inositol phosphates and 1,2-diacylglycerol are formed when membrane-bound phosphoinositides

are hydrolysed in response to receptor stimulation. Among the selective receptors located on the cell surface are those with which neurotransmitters, neuromodulators, hormone and growth-promoting factors interact to elicit their diverse physiological and metabolic responses. The transduction and amplification of extracellular signals are mediated by the surface receptors by generating inositol phosphate and 1,2-diacylglycerol, which function now as second messengers. DNA synthesis, cellular metabolism, growth, synaptic transmission, neuronal membrane excitability, sensory transduction, muscle contraction, motility and platelet aggregation are some of the physiological processes in which the 'dual messenger' system operates. Recent advances in the knowledge of CNS and related neural tissue receptors and phosphoinositide hydrolysis are reviewed by De-Maw Chaung.

Technical advances in the area of X-ray crystallography of macromolecules have made rational antiviral drug design a reality today. Azidothymidine, an effective agent against human immunodeficiency virus (HIV), the aetiologic agent of AIDS, is now readily available in the market. Other commercially exploited antiviral agents—acyclovir, idoxuridine, amantidine and others—were all designed on an understanding of a prototype drug/viral structure or functional protein interaction at the atomic level. All these share the important property of the ability to inhibit the process of uncoating (following adsorption to and penetration of the cell membrane) by which viral nucleic acid is released from the viral protein shell or capsid into the cytoplasm of the infected cell. These interesting developments have been reviewed by McKinlay and Rossmann.

Leukotrienes derived from arachidonic acid have been shown to possess a constellation of pharmacologic effects on respiratory, cardiovascular and gastrointestinal systems. Receptor antagonists of leukotriene are potential therapeutic agents. Two reviews discuss the recent developments in this area and the nature of the receptors, which have now been found in platelets as well as in many vascular tissues.

A review of the biochemical mechanisms of hepatic peroxisome proliferation by xenobiotics, of interest to those working in the area of cancer

induction, is presented by Lock *et al.* For those concerned with basic molecular mechanisms of action of toxic chemicals, the review by Juchan on the bioactivation of teratogens, the critical account given by William of the methods for evaluating chemical genotoxicity, and the one on human cytochrome P-450 by Guengerich will be of considerable interest.

The exciting developments anticipated in the chemical coding of neurons and the involvement of release and interaction of several transmitter substances are presented by Furnen *et al.* Thrombolytic therapy in myocardial infarction has been legitimized by the approval of the use of streptokinase and intravenous recombinant tissue plasminogen activator. The fundamental biochemical advances made in this area are reviewed by Bang *et al.* Other chapters deal with amino acid-based neurotransmitters, the recent advances in unravelling the role of 'transfer factor' involved in the transfer of immunity in tissue transplants, development of animal models for reproducing human stroke, and the nature and magnitude of indoor pollutants in highly developed societies. The review of reviews on recent advances in the pharmacology of drug addiction is very topical. Considering the rate at which progress is being made in biochemical pharmacology and toxicology, an area of great relevance to human health, one wonders whether *Annual Review of Pharmacology and Toxicology* may have to be replaced by half-yearly reviews or critical reviews on select topics.

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Space-Related Materials Advances in Materials Technology: Monitor, (Published by Dept for Industrial Promotion Consultations and Technology, UNIDO, P.O. Box 300, A 1400, Vienna, Austria), pp. 64.

This UNIDO publication, a part of its 'Advances in Materials Technology: Monitor', provides an excellent overview of developments in both the use of materials for space applications and in the processing of materials in space.

The theme for the entire publication is set in the first article by Mir Akbar Ali. Ali reviews work on space materials processing in the USSR, USA and Europe. Through the illustrative example of the growth of silicon ribbon for integrated circuit fabrication in the zero-*g* condition of space the advantages that can accrue from the use of space processing is highlighted. While it is difficult to draw firm conclusions on the economics of manufacture of different materials in view of the paucity of published data, the methodology is useful in assessing potential products for space manufacture.

The second part of Ali's article focuses on various materials that have been developed for use in satellites and rockets. Carbon fibre, in view of its importance, is given primacy of place and the technology of carbon fibre production is dealt with in some detail. The new ceramic materials and their methods of fabrication for high temperature applications (Sailons) and integrated optics (gallium arsenide, lithium niobate, etc.) are covered adequately in an easy-to-understand way.

This keynote article is followed by a series of extracts from different technical publications dealing with various developments of materials for use in space as well as materials manufactured in the space environment. New processing techniques such as rapid solidification, superplastic formation, made-to-design composite materials and new alloy developments are all covered to varying levels of detail.

The advantages of processing materials in space, such as containerless processing and the absence of gravity, are well illustrated through selected extracts that provide information relevant to decision makers. While the sections on physics of solidification, heat transfer and fluid dynamics involved in processing materials in space, including the section on glasses, are quite informative, the tables and charts provide valuable information for top-management decision-makers.

The section on markets gives a good idea of how different countries view space materials processing from a commercial viewpoint, even though some of the projections appear to be on high side. The research guide on major activity centres would also be of great use to organizations interested in entering this new field. Snippets, such as the sale of space beads made by the US National Bureau of Standards (which is the first commercial space-manufactured product, sold to over 300 organizations at \$386 a piece) make this an eminently readable publication.

On the whole the publication provides an excellent overview covering the applications of materials in space systems, materials processing in space and associated research trends/outlook in various institutions the world over. Under the international listing (page 45), the entry for Indian Space Research Organization should read Indian Space Research Organisation (ISRO), Antariksh

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RESEARCH GRANTS FROM CENTRAL SILK BOARD

The Central Silk Board is implementing the National Sericulture Project at a total cost of Rs. 555.3 crores spread over a period of five years from 1989 with financial assistance from the World Bank and the Swiss Development Co-operation. The collaborators of the project will the Central Silk Board are the five traditional silk-producing States of Karnataka, Andhra Pradesh, Tamil Nadu, West Bengal and Jammu and Kashmir.

The main thrust of the National Sericulture Project is directed towards providing R&D support to the growth of Sericulture and Silk Industry. In order to achieve this objective, the National Sericulture Project provides funds to Universities to support research programmes in Sericulture and Silk Technology. This scheme is centrally administered by the Central Silk Board.

Universities interested in availing this opportunity may obtain further details from:

The Member Secretary,
Central Silk Board,
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