

BOOK REVIEWS

OXYGEN FREE RADICALS AND THE TISSUE INJURY

Edited by B. Matkovics, D. Boda and H. Kalász

Akadémiai Kiadó, Budapest, 1988

412 Pages

The twentieth anniversary of the discovery of superoxide dismutase is a fitting occasion to publish books on oxygen free radicals and tissue injury. Early doubts about the toxicity of the superoxide radical have been dispelled. It is well known that generation of superoxide radicals sufficient to overwhelm the antioxidant defence mechanisms of living cells produces oxygen free radical cascades that cause extensive tissue damage in various organs. The study of oxygen free radicals is well established in experimental and clinical medicine. This book is a testimony to the immense interest in oxygen free radicals in disease. The book is a collection of 44 papers presented at a colloquium held by Hungarian workers in Szeged in 1986. The main thrust of the colloquium was in medicine. The areas of medically relevant free radical research that were discussed included detection of free radicals; singlet oxygen damage; effects of ionising radiation; catalase; lipid peroxidation; the concept of free radical pathology; free radical scavengers; paraquat toxicity; ethanol intoxication; free radical effects on red blood cells; various disorders of leukocytes; trisomy-21; cataract; rheumatoid arthritis and osteoarthritis; gastric ulceration and gastritis; myocardial injury; aging and development; prematurity and neonatal pathologies; and adult respiratory distress syndrome. Non-medical questions raised were superoxide dismutase in earthworms which have a high resistance to xenobiotics, and protective mechanisms against photodestruction of chlorophyll. The depth of discussion was variable. It is a disappointment to find no mention of possible catalysis of the Haber-Weiss reaction by ferritin in synovial fluid in the presentation on rheumatoid arthritis. This is a hypothesis with considerable explanatory power. Of particular interest are the presentations concerned with the mechanism of action and therapeutic potential of free radical scavenger drugs. Hungarian workers are developing antioxidant drugs with high therapeutic index based on dihydroquinoline. Results on these drugs are awaited with much interest. The concept of free radical disease has acquired firm roots among Hungarian workers. This book gives a good vista of the vitality of Hungarian research on free radicals.

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CORONARY HEART DISEASE: RISKS AND REASONS
AG SHAPER

Current Medical Literature Ltd, London, 1988, 70 pages

This attractively-presented little book, by a distinguished Professor of Clinical Epidemiology sets out to explain current views of the origin of coronary heart disease (CHD). It succeeds admirably. Chapter 1 outlines the basic pathology of atherosclerosis, although the role of macrophages is not discussed. Chapters 2 and 3 discuss the factors associated with the prevalence and incidence of CHD, with an excellent account of how population data may be analyzed. Chapter 4 presents and analyses clearly the results of the Framingham heart study and the British Regional heart study, whereas Chapter 5 summarizes and evaluates the major risk factors for CHD. Chapters 6 and 7 discuss coronary heart disease in Britain, and are followed by three Chapters that critically address the question as to how CHD might be prevented. The book is superbly illustrated and can be recommended with confidence to general practitioners, scientists and medical students.

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LIPID PEROXIDATION IN BIOLOGICAL SYSTEMS
(Ed. Alex Sevanian) American Oil Chemists' Society

As readers of this journal will know, lipid peroxidation is a topic that attracts a great deal of interest. In the last fifteen years or so we have witnessed an exponential rise in the number of publications concerning lipid peroxidation and the general trend of those papers has been towards the study of biological systems. The reasons for this are clear. First, it is an important topic, now that it is accepted that free radicals are produced in living cells and may be involved in certain tissue injuries and that lipid peroxidation can be a significant pathological mechanism. Second, it is still a rich vein to tap since, despite intensive investigations over many years, there is still a very great deal to learn about lipid peroxidation from its fundamental chemistry to its occurrence and consequences in biological systems.

This book attempts to address some of the pertinent questions that concern biochemists at the present time. It is derived from a symposium held under the joint auspices of the American and Japan Oil Chemists' Societies in Honolulu in May 1986.

As such, it has been a little slow in being published. This is mostly balanced by the quality of the book's production, it being hard-backed and type-set, but there are a discomfiting number of typographical and grammatical errors. As with all symposium proceedings, it is really a collection of extended papers rather than a comprehensive treatise on the subject. Nevertheless, the contributions found here are interesting and mostly well written, so it is a worthwhile and useful publication. The contents largely reflect the bi-partisan nature of the symposium: seven chapters each from the Japanese and American contributors and two from Europeans. The meeting was reportedly divided into three sections concerned with the evidence of occurrence of lipid peroxidation in biological systems, mechanisms for its induction and inhibition, and methods by which lipid peroxidation may be detected *in vivo*. This division of sections is not readily apparent in the book and the emphasis is rather on the study of mechanisms of induction and inhibition and on the pathological role of lipid peroxidation. The section on new methods is perhaps under-represented considering the need that exists for methods capable of yielding quantitative and qualitative data from biological systems undergoing low levels of lipid peroxidation, eg *in man*.

The choice of topics under the banner heading of lipid peroxidation is eclectic if not comprehensive and includes on or two subjects that are often neglected. Examples are the occurrence of lipid peroxidation in plants, here the physiological role of plant lipoxygenases is considered by Zimmerman, and the formation of cholesterol oxidation products *in vivo* and *in vitro*, here discussed by Wu. I only have space to mention the papers that I found of most interest. The paper by Niki on the water-soluble biological antioxidants is clear and economical in its writing and reflects the elegant simplicity of his experiments. Wendel contributes a typically thorough study of the role of iron release and lipid peroxidation in the mechanism of allyl alcohol induced hepatotoxicity and van Kuijk describes his very sensitive GC-MS method of detecting lipid peroxidation products *in vivo*, here following vitamin E deficiency. In consecutive chapters, the editor (Alex Sevanian) and Kelvin Davies promote the roles of, respectively, lipolytic and proteolytic enzymes as secondary antioxidant defences. Sevanian is describing the action of phospholipase A₂ in preferentially removing oxidised fatty acids from membrane phospholipids. Davies reports that protein degradation induced by oxidative stress is not necessarily mechanistically associated with lipid peroxidation and that the cellular response may be to utilise proteolytic enzymes to remove damaged proteins. The brief paper by Lands shows no data but nevertheless very lucidly puts forward the author's hypothesis that the steady-state cellular concentration of lipid peroxides ('peroxide tone') is of great importance in regulating eicosanoid formation and thereby pathophysiological events subsequent to oxygen radical production. Finally Parthasarathy contributes an excellently written paper clearly summarising the possible role of oxidative modification of low-density lipoprotein in the pathogenesis of atherosclerosis.

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