

BOOK REVIEW

G. POLI, K.H. CHEESEMAN, M.U. DIANZANI and T.F. SLATER (Eds.)

Free Radicals in Liver Injury (Proceedings of the International Meeting held in Turin, June 27-29, 1985),

IRL Press, Oxford, 1986, 230 pp. £28.00p. US\$50.00c.

Research into free radicals in biological systems continues unabated and the literature continues to grow and present problems of assimilation. In the words of one of the editors, this book aspires to an up-to-date and hopefully comprehensive selection of basic and clinical contributions to the study of the role of free radicals in liver injury. The book is a collection of 31 contributions to a meeting of experts. It is neatly produced in five sections which deal respectively with general aspects and free radical detection; free radicals and lipid peroxidation; free radicals and cell death; free radical mechanisms in liver disease; and mechanisms of protection. The material presented in largely biochemical.

The highlights of the book are the review articles, which are very tightly written. Together they provide a compact introduction to the latest knowledge of detection of free radicals (H. Sies); lipid peroxidation products with emphasis on non-malondialdehyde (MDA) carbonyl compounds (H. Esterbauer); the hepatotoxicity of chronic iron overload (B.R. Bacon and colleagues); the role of haloalkylation and lipid peroxidation in CCl_4 -induced hepatotoxicity (M. U. Dianzani and G. Poli); and free radical scavengers (T. F. Slater and colleagues). Some points made can be mentioned here to prompt reading. For instance, the popular thiobarbituric acid (TBA) assay is highly sensitive for MDA and fails to provide an indication of the amount of additional reactive breakdown products of lipid peroxidation. Important among these products are 4-hydroxyalkenals which mediate many toxic reactions (H. Esterbauer) including genotoxic effects (G. Brambilla and colleagues). Some genotoxic effects previously attributed to MDA were probably due to impurities! To give another example, a highly successful animal model of chronic iron overload has demonstrated hepatic lipid peroxidation as a function of iron deposition and possible disruptive effects on mitochondrial and microsomal electron transport (B. R. Bacon and colleagues). Lipid peroxidation in this model was assessed in terms of conjugated diene formation. Investigation of this 'retrospective measure of free radical activity' has shown that a phospholipid-esterified 9, 10-linoleic acid isomer accounts for over 90% of diene conjugation in human tissues and body fluids. This product probably represents the stabilization of a lipid free radical occurring by reaction with a protein moiety, and demonstrates that diene conjugation in man can no longer be attributed to lipid peroxides and peroxidation products (T. L. Dormandy)! The linoleic acid isomer is greatly increased in liver and serum of alcoholics.

Almost inevitably the book concentrates attention on CCl_4 and to a lesser extent on alcohol and paracetamol hepatotoxicity. Multiple processes in fatty acid infiltration (fatty liver) and acute liver cell necrosis are emphasized (M. U. Dianzani and G. Poli and throughout the book). Discussion of protective mechanisms is restricted to free radical scavengers excluding enzymes involved in free radical detoxication processes, though there is an introduction to phospholipid hydroperoxide glutathione peroxidase (formerly PIP: 'peroxidation inhibitory protein'), which does not require the concerted action of phospholipase A_2 to utilize fatty acid hydroperoxides as substrates (F. Ursini and colleagues), and to glutathione transferase isoenzymes (D. H. Meyer and colleagues). An ingenious use of the spin trap phenyl butyl nitron to prevent 'free radical' shock in the rat is described (G. P. Novelli and colleagues).

These are only a small part of the aspects of free radicals and liver injury touched in the book. Unfortunately much of the material is not for the uninitiated but for those thoroughly steeped in the subject. Almost certainly books like this can disseminate knowledge of free radicals among interested readers. Whether they can help in the avowed aim of many free radical scientists 'to put free radicals on the medical map' is open to reasonable doubt. Medical imagination has yet to be fired in the area of free radicals.

W. H. Bannister
Nuffield Dept. of Clinical Biochemistry
University of Oxford
Radcliffe Infirmary
Oxford