

BOOK REVIEW

Toxicology of the Kidney (Second Edition)

Edited by J.B. Hook and R.S. Goldstein Raven Press, New York, Pp558, 1993.

Current interest in the toxicology of the kidney is reflected by the appearance of the Second Edition to deal with this subject in the excellent series Target Organ Toxicology. The book is divided into four sections, the first is concerned with basic principles of the anatomy, physiology and the functional assessment of the kidney. The second deals with general features and known mechanisms of nephrotoxicity, while the last two sections deal with specific nephrotoxicants used in therapeutics and occurring in the environment. There are nineteen Chapters written by experts and all are copiously referenced. The presentation is uniform throughout and the Tables and Figures are simply and clearly presented. There is very little repetition between the different Chapters and they all contain a wealth of information on each topic.

The most striking feature of this book is the large number of different compounds discussed which is a reflection of the kidney's susceptibility to toxic damage because of its large blood supply, ability to concentrate metabolites, high metabolic activity and the occurrence of transcellular transport. Its vulnerability to toxins varies in many ways from other organs and its response to potentially nephrotoxic drugs and agents is often primarily determined by associated physiological and haemodynamic conditions prevailing at the time of exposure. Many agents exert at least their initial effect in a site-specific manner eg. immune complexes attack the glomerulus while analgesics damage the papilla. Although response can be dose-dependent this is not always the case. Another distinctive feature of the kidney is its biochemical heterogeneity which is associated with morphological and functional specialisation along the nephron. For example, mixed function oxidases are not distributed uniformly throughout the kidney, e.g. the greatest cytochrome-P-450 being localised in the proximal tubules, and xenobiotic metabolism occurs via competing and sequential pathways. The balance between bioactivation and detoxification activities is probably critical in the determination of the onset and development of toxicant-induced damage. All these difficult issues are tackled in the various sections in an understandable way using an interdisciplinary approach.

The Editors aim was to create a book which would serve as an introduction for some, a review for others, and a text for many and they have achieved this objective. The emphasis on environmental toxins is particularly welcome as is the Chapter on renal cancers. However, much remains to be done before we fully understand fully the mechanisms involved in chemically-induced injury to the kidney. This book will therefore be of interest to individuals engaged in free radical research. Since the early stages of toxic damage are silent, knowledge of the sequence of molecular perturbations is an essential prerequisite for the development of earlier markers of toxic damage. The availability of such markers will enable removal of the exposure or modification of the treatment to be carried out. This state of the art book is warmly recommended to those involved in the study of toxic damage to the kidney and hopefully it will stimulate the interest of molecular scientists in this important field.

In addition it will provide an educational aid to advanced students of toxicology, nephrology and those interested in environmental pollution.

R.G. Price
Biochemistry Section
Division of Life Sciences
King's College

Toxicology of the Lung, Second Edition.
Edited by: Gardner DE, Crapo JD, McClellan RO.

This volume forms part of a series of books entitled 'Target Organ Toxicology' and deals with the lung. Broadly speaking, the editors aim to explore recent advances in assessing and evaluating the toxicological relationship between inhaled substances and any increased risk of respiratory disease. As the field of toxicology is becoming ever more dependent upon the use of the inhaled route to test the health effects of airborne chemicals, the timing of the book is therefore impeccable. The early chapters deal with animal models, anatomy, and cell structure and function including that of the nose. The detail is considerable. Line drawings of the construction of dynamic exposure systems are interspersed with those of equipment designed to generate vapour from chemicals and fibre fibrils from solid materials.

The ability to make correct extrapolations between animal studies and humans chronically exposed to environmental airborne pollutants is clearly important and a good deal of complex mathematics is included in sections designed to clarify the relationships between the geometry of the major airways, alveolar ducts, alveoli and particle deposition. This reviewer confesses to having found much of this material heavy going. Of more immediate interest to the clinician or epidemiologist are those chapters exploring the use of cellular, molecular and immunological markers of lung damage; and those explaining the calculation of health risk such that improved estimates of health risks from inhaled particles can be made.

For those interested in lung toxicology this book is clearly required reading. It is clearly presented with plenty of illustrations and line drawings and the writing, by experts in the field, is for the most part clear and concise. In the end, however, the appearance of a second edition so soon after the first is testimony to its utility to those working in the field.

Timothy W. Evans BSc. MD. MRCP. PhD.
Reader in Critical Care,
National Heart and Lung Institute;
Consultant in Thoracic and Intensive Care Medicine,
Royal Brompton National Heart and Lung Hospital,
London SW3 6NP.

**Biological Consequences of Oxidative Stress
Implications for Cardiovascular Disease and Carcinogenesis**

Edited by L. Spatz and A.D. Bloom

Oxford University Press, New York/Oxford, 1992

This book was produced by an interdisciplinary study group established by The Conte Institute for Environmental Health (Pittsfield, Massachusetts). The topics which are presented and critically discussed in 8 chapters range from basic chemistry of oxygen radicals, genetics and molecular biology to reperfusion damage, atherosclerosis and cancer. The introduction, written by the editor L. Spatz gives an overview on the chemistry of molecular oxygen, the various enzymatic and non-enzymatic antioxidant defence systems, lipid peroxidation and biomedical consequences of oxidative damage. Chapter 2, by R.P. Mason, discusses free radical metabolites produced from xenobiotics and drugs. Chapter 3, by R.J. Korthius, D.L. Carden and D.N. Granger reviews cellular dysfunction as consequence of ischemia/reperfusion with particular emphasis on the role of granulocytes as source of oxygen radicals. Chapter 4, by G.M. Chisolm, leads us into an evergrowing field of free radical research: the oxidation of lipoproteins and its implication for atherosclerosis. We often forget that this is still a hypothesis. The critical discussion of the circumstantial evidences of existence of oxidized LDL in vivo and its causal participation in the development of disease can therefore be seen as an important aspect of this chapter. Chapter 5, by S. Linn, deals with DNA damage and stress response caused by oxygen radicals. Most of our present knowledge is for *E. coli*, where a great number of oxygen radicals sensitive regulons were discovered. Chapter 6, by N.H. Colburn, describes for mammalian cells regulation of gene expression by oxygen radicals and stress and the role of stress-induced gene expression in tumor promotion and progression. Chapter 7, by R.G. Stevens and K. Neriishi, provides a review on investigations on the potential role of redox active iron, oxygen radicals for development of human cancer. The book concludes with chapter 8, by T.W. Kensler and K.Z. Guyton, addressing the important issue of cancer protection by natural and synthetic antioxidants. The authors also discuss that in certain circumstances antioxidants may be a double-edged sword showing anticancer and carcinogenic properties.

The literature quoted in each chapter is carefully selected and ends with the year 1990. Most of the chapters are easy to read, even without special knowledge in free radical chemistry and methodology. I enjoyed reading this excellent book and I recommend it highly, particularly to all those interested in implications of free radicals in cardiovascular disease and cancer.

Professor H. Esterbauer
Institut Für Biochemie
Universität Graz
Austria