

## BOOK REVIEW

### **Glutathione Conjugation: Mechanisms and Biological Significance**

Edited by H. Sies and B. Ketterer

Published by Academic Press, London, 1988, pp. 496.

Price (U.K.) hardback £47.50, ISBN: 0.12.642755.0

Glutathione ( $\gamma$ -glutamylcysteinylglycine, GSH), a simple endogenous tripeptide, plays many and varied roles in cellular biochemistry. GSH is recognised as a protective device within cells, since it reacts with and removes from the body potentially toxic electrophilic compounds. However, in recent years a number of mechanisms have been uncovered, by which glutathione conjugate formation results in more reactive/toxic species. And yet another recent discovery, unrelated to detoxication/toxication, is that GSH participates in the biosynthesis of leukotrienes, chemical mediators of profound physiological importance.

The above brief comments are intended to indicate how important this subject matter has become in recent years. It is perhaps appropriate that this book is published in 1988, the hundredth anniversary of de Rey Pailhade's discovery of glutathione. It is an excellent book, containing fourteen authoritative, well referenced and up to date chapters by eminent specialists in this field. The book is produced to the usual high standards that one has grown to expect from Academic Press, and at £47.50 for a 500 page book represents extremely good value for money. Both the editors and the publishers are to be congratulated on a very well produced book.

Each of the fourteen chapters starts with a clear introduction, outlining the problem and scope, and is followed by several sections dealing with the chemistry and biochemistry of glutathione conjugation. This clear organisation of material and the well-drawn diagrams, help the readability considerably. The first five chapters by K.J. Douglas (Chapter 1), P. Wardman (Chapter 2), B. Ketterer *et al* (Chapter 3), C.B. Pickett & A.Y.U Lu (Chapter 4) and R. Morgenstern & J.W. Depierre (Chapter 5) deal in detail with the various model systems and enzymes which effect glutathione conjugation. This is followed by an excellent chapter by one of the editors (H. Sies) on the competition of glutathione conjugates with other transport systems at the cell surface as well as in the interior of

the cell. The chapter by Peterson & Guengerich (Chapter 8) is a good comparison of the major features of GSH S-transferases and P-450, the two most widely studied enzyme systems in drug metabolism.

The role of the GSH-System in drug detoxication, drug toxication and drug resistance is covered in three chapters. The in vivo aspects of GSH-conjugation are finally covered in the remaining chapters. Chapter 13 by Dekant et al is particularly recommended for its lucid description of the role of cysteine conjugate  $\beta$ -lyase in the bioactivation of GSH-conjugates. The book as a whole is remarkably free of typographical errors, and individual chapters are up to date, with many references dated to 1987. This book is therefore essential reading for all those involved in studying the biochemistry, molecular biology and role of the GSH conjugation system.

Reviewed by L.A. Damani, King's College London, University of London

**Sulphur-Containing Drugs and Related Organic Compounds:  
Chemistry, Biochemistry and Toxicology, Volume 1, Parts A and B:  
Metabolism of Sulphur Functional Groups**

Edited by L.A. Damani

Published by Ellis Horwood Ltd., Chichester, U.K., 1989

Part A, ISBNB: 0-7458-0215X, pp 167, price £35.00 (U.K.)

Part B, ISBB: 0-7458-216-8, pp 324, price £45.00 (U.K.)

This is the first volume in a classic new series of books designed to collate and critically review current knowledge concerning the chemical mechanisms of biotransformation and drug toxicity. Sulphur containing drugs and related organic compounds is a comprehensive three-volume work which organises all material on sulphur xenobiochemistry in a "library" of books which will be a standard reference source on the subject for many years to come: the first of these volumes: "Metabolism of Sulphur Functional Groups", is sub-divided into Parts A and B which together cover the chemical and biochemical reactivity of organic compounds with different types of sulphur functionalities, taking account of all the latest information from authoritative sources world-wide.

Part A commences with an editorial introduction to the subject which both outlines the main features of the role of such organosulphur compounds in biochemical processes, and shows how research emphasis in recent years has shifted to exogenous synthetic compounds used in industry, agriculture and medicine. The book deals with the importance and uses of sulphur xenobiotics, and surveys the metabolism of inorganic sulphur compounds as well as thioethers, thiols and disulphides.

Part B takes up the chemical and mechanistic theme of Part A, discussing the processes involved in desulphuration of phosphothionates, thioamides and thiocarbamides. The authors then progress to an exposition of the further metabolism of sulphoxides, sulphones, sulphonamides and sulphonium compounds: and concludes with chapters reviewing metabolism of sulphur heterocycles and sulphur-containing secondary metabolites.

**Contents: Part A: Introduction; Naturally Occurring Sulphur Compounds; Agricultural Importance of Xenobiotics; Inorganic Sulphur Compounds; Thiols, Dithioic Acids, Disulphides and Thioethers: Phase I and Conjugation Reactions.**

**Contents: Part B: Phosphorothionates, Thioamides; Thiocarbamides; Carbamothioates and Carbamodithioates; Sulphoxides and Sulphones; Sulphonium Salts; Sulphonamides; Sulphamates, Sulphonates and Sulphate Esters; Sulphur Heterocycles; Glucosinolates, Alliins and Cyclic Disulphides: Sulphur-containing Secondary Metabolites.**

**by H. Kelly, Ellis Horwood Ltd. Chichester, U.K.**