

Book Reviews

Analysis of Free Radicals in Biological Systems

Edited by A. Favier, J. Cadet, B. Kalyanaraman,
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DM 178

The aim of this book is 'to provide a comprehensive survey on recent methodological aspects of the measurement of damage . . . which may be used as an indicator of oxidative stress'. It is presumably an offshoot of the training courses in free radical methodology held periodically in Grenoble.

The book begins with a discussion of the chemistry of O₂, generally good although a few errors are present, e.g. reduction of O₂ to H₂O is not a two electron reduction of each oxygen molecule as stated on page 3. Chapter 2 competently reviews biological sources of reduced oxygen species whereas NO chemistry and biology are introduced in Chapter 3 (fairly good on chemistry, a bit limited on biology). Chapter 4 expands the NO theme by discussing its pro- and anti-oxidant effects in a clear and comprehensible way.

Oxidative damage to DNA is the subject of excellent review by Cadet *et al.* in Chapter 5, although I would have preferred a more extensive discussion of the pros and cons of the various methods. Cadet *et al.* discuss HPLC analysis of 8-oxopurines in detail in Chapter 15 and the measurement of damaged bases by GC/MS in Chapter 18. Equally good is the discussion (by Parthasarathy) of the mechanisms of LDL oxidation by cells. I especially enjoyed the summary

tables, carefully documenting possible artefacts in the published literature.

Chapter 7 is devoted to a well-written review of free radicals and antioxidants in human disease, followed in Chapter 8 by a discussion of methods for the demonstration of oxidative stress in humans. Chapter 9 (on hypericin and O₂^{•-}) seemed somewhat out of place, more like an original research paper than a methodological discussion. The next two chapters, however, restore the theme of the book and present excellent discussion of nitron spin trapping to follow LDL oxidation, and esr measurement of ascorbate radical as a bioindicator of oxidative stress (the latter, by Buettner and Jurkiewicz, gives particularly valuable methodological comments).

The book continues with a good account of lipid peroxide analysis by HPLC, although this chapter could have been broadened, I feel, by the discussion of methods of detection other than mercury cathode electrochemical detection. TBARS determination is discussed in detail in Chapter 13 and measurement of LDL oxidation in Chapter 14 (good, but I would like to have seen more discussion of how 'contamination of the lipoprotein can be minimized' page 204; when the short-run bench-top centrifugation methods for LDL isolation are used).

Chapter 16 discusses the measurement of DNA fragmentation in apoptosing cells (good, but why not more on apoptosis generally and additional methods for showing it?), whereas Chapter 17 presents methods for measuring -SH groups and

carbonyls in blood plasma. I would have appreciated more discussion of the authors' results for carbonyls in relation to others in the literature, and the more difficult determination of carbonyls in tissues was not presented.

Chapter 19 discusses the use of cell culture models for studies of oxidative stress, emphasizing in an exemplary fashion the influence of cell culture medium constituents and the limitations of the various viability assays. Nitric oxide reappears in Chapter 20, where methods for its measurement are presented, including a good summary table (Table 1) and a very interesting account of the reaction of NO with tyrosyl radicals at the active site of ribonucleotide reductase. The book ends with a discussion of salicylate hydroxylation as an assay for OH^\bullet , very well-presented but it could have been expanded to discuss other aromatic detector molecules in more detail.

Overall, this is an attractively-presented book (I liked the blue/white/bright yellow cover), generally well-written with several excellent chapters. I am pleased to have it in my office and I recommend it to others.

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Essays in Biochemistry Volume 29 1995 Edited by DK Apps and KF Tipton

The current volume number 29 in the outstanding Essays in Biochemistry series is again a superb collection of 11 essays in subjects of great depth and interest to researchers interested in Biochemistry either directly or at points of tangential interest.

The first essay (Jamin *et al.*) covers the ever topical issue of the action of penicillin, in this case in relation to an in depth focus on bacterial DD-transpeptidases. This essay will be of particular use to all those involved in the teaching of mechanisms of drug action as well as those involved in researching the problems of penicillin resistance and design of new structural analogues of penicillin for therapeutic use. The second essay (Suzuki) is a useful account of sphingolipid activator proteins.

Essay number three (Rice-Evans *et al.*) will be of particular interest to readers of Free Radical Research as it considers the important area of free radicals and antioxidants in relation to atherosclerosis. The concept of the importance of oxygen toxicity in relation to premature neonates and how this can be assessed and prevented is given considerable coverage.

Human skin is another area of growing importance in research terms and this is very satisfactorily dealt with in relation to reconstructed human skin for use in transplants and as grafts in essay number 4 (Wood and Harris). Different aspects of molecular chaperones are covered in essays 6 (Lund) and 7 (Burston and Clarke).

Affinity purification as a method for protein purification is the subject of essay 8 (Irwin and Tipton) while essay 11 deals with protein stability at high temperatures (Cowan). This most worthwhile collection is completed by essay 5 on opsin genes (Maden), essay 9 on prion diseases (Smith and Collinge) and essay 10 on ribozymes (James and Turner).

A reasonably adequate index makes this volume a nice addition to anyone's bookcase.

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