

Book Reviews

FREE RADICALS, OXIDATIVE STRESS AND ANTIOXIDANTS. PATHOLOGICAL AND PHYSIOLOGICAL SIGNIFICANCE, EDITED BY T. OZBEN NATO ASI SERIES, PLENUM PRESS, NEW YORK AND LONDON, 1998.

This book is a report of the proceedings of the NATO Advanced Study Institute (ASI) held in Antalya, Turkey, from May 24–June 4 1997. Conference proceeding volumes are usually a mixed bag, not helped by the fact that by the time they appear most of the good work will already have been published in the literature. The present volume reached me for review in June 1998, approximately a year from the conference date.

On reading the book, however, I was pleasantly surprised. Many authors took the trouble to produce combinations of review material with new data, generating interesting and useful contributions. I particularly enjoyed (in order of appearance) the articles on iron metabolism, the redox chemistry of desferrioxamine, electron transfer in proteins, free radical-mediated oxidation of proteins (especially the discussion of how protein carbonyls are generated), nitric oxide as an antioxidant in the vasculature, the chemistry of the interactions of myoglobin with H_2O_2 , free radicals and adhesion molecules, effects of reactive species on mitochondrial ATP synthase, pathophysiology of cerebral ischaemia/reperfu-

sion, cytochrome oxidase activity in relation to Alzheimer's disease, the discussion of general mechanisms of antioxidant action by Cadenas, and the chapters on ubiquinol and on lycopene and the other carotenoids.

Overall a useful book. Obviously, only a selection of the papers presented at this major conference has been included, but it is a quality selection. I am not sure what the book's shelf life (or sell by date?) will be however,

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IRON TRANSPORT AND STORAGE IN MICROORGANISMS, PLANTS AND ANIMALS. METAL IONS IN BIOLOGICAL SYSTEMS, VOLUME 35, EDS. A. SIGEL, AND H. SIGEL, MARCEL DEKKER INC, NEW YORK, 1998.

As an "iron man" from way back (longer than I care to remember), I was pleased to receive this book for review, and even more pleased to see from the title that plants and bacteria were not being neglected. Having read the book in detail, my initial enthusiasm was not dulled and I recommend it heartily as a good account of the interaction

between iron (the fourth most abundant element in the earth's crust) and living organisms. Despite its abundance, iron is poorly bioavailable and organisms invest great effort into obtaining it. Having acquired iron in a soluble form, protection is then required against iron-mediated free radical damage whilst exploiting the redox chemistry of iron to catalyze energy production and other essential biological processes.

Chapter 1 deals with oceanic iron, with an interesting account of iron limitation on the growth of aquatic organisms. It is followed by a discussion (Chapter 2) of how pathogenic bacteria acquire iron despite the best efforts of their host to prevent this. Chapter 3 expands on this theme by discussing the mechanism, kinetics and control of bacterial iron transport systems, including haem. Chapter 4 does the same for fungi and yeast. Chapter 5 discusses iron uptake by higher plants and their symbiotic soil bacteria; plant iron metabolism is developed further in Chapters 6 and 14 (the latter devoted to plant ferritins and complementing the adjacent Chapters on animal ferritins). The thermodynamics and kinetics of iron binding to siderophores is well reviewed in Chapters 7 and 8, whereas Chapter 9 discusses the chemistry of siderophore receptor proteins in bacteria.

Finally, we arrive at animals, with excellent reviews on iron responsive elements (Chapter 10),

ferritins (Chapters 11–13), transferrins and their receptors (Chapter 15) and human iron metabolism (Chapter 16). Aisen (page 617) makes an important caution on the use of "ferrous specific" chelators to measure iron reduction – these chelators also bind iron (III) and alter its reduction potential so that one is really measuring reduction of the chelate, not of "free" Fe (III). Chapter 16 says surprisingly little about the putative "low-molecular-mass iron pool" and the recent attempts to quantitate it using fluorescent iron chelators, perhaps a topic that should have had a Chapter to itself. The book ends with a good Chapter on the use of iron chelators, especially mechanisms by which they may be toxic.

Overall, this is a good book and I recommend it as an excellent account of "global" iron metabolism. Criticisms – the figures are often poorly reproduced and the book is already out of date in a few places. Nevertheless, it has done a service in drawing together a vast range of information. The index has good coverage of the topics in the book.

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