

H. Sies (ed.), *Oxidative Stress* (Academic Press, London, 1985), 507 pp.

In his introduction to this book, Helmut Sies is rightly preoccupied with word usage. One tends to associate the word 'stress' with the ideas of Selye Hans-Selye published his book *The Stress of Life* in 1956. Ten years later René Dubos in his Silliman Lectures volume *Man Adapting*, complained: "the word stress has been used so much and so carelessly that its meaning is becoming increasingly vague". Oxidative stress is a convenient term for "disturbance in the prooxidant-antioxidant balance in favour of the former" in biological systems. Helmut Sies and his contributors to this book have clearly set out to remove any vagueness attached to the concept of oxidative stress.

The book is in two main parts. The first part deals with mediators and mechanisms of oxidative stress or prooxidant states. Among the subjects discussed are aerobic ionizing radiation, the prototype of a prooxidant; organic peroxy free radicals as ultimate agents of oxygen toxicity; hydroperoxides (namely, *t*-butyl hydroperoxide) and thiol oxidants (namely, diamide) as tools in the study of oxidative stress in intact cells and organs; quinone-induced oxidative injury to cells and tissues (covering menadione and adriamycin); nitrosoureas (which carbamylate and deplete glutathione reductase); antimalarials (protozoan parasites are vulnerable to free-radical-induced oxidative stress); hypoxia and hyperoxia (hypoxia may facilitate the generation of active oxygen species by redox cycling — oxidative stress can be potentiated by reductive stress); and dietary factors (by the late E.D. Wills, a pioneer in studies of lipid peroxidation).

The second part of the book deals with damage produced by oxidative stress. Understanding this damage helps to fathom many aspects of the pathobiology of disease. Specific molecular processes discussed include disturbance of Ca^{2+} homeostasis (hydroperoxides induce the release of Ca^{2+} from isolated intact rat liver mitochondria and from mitochondria in intact hepatocytes); formation of mixed disulphides; lipid peroxidation; and formation of excited carbonyl compounds and singlet oxygen (the vexed subject of "photochemistry in the dark"). Prooxidant states at tissue level are discussed in relation to red blood cells, neutrophils and neurons (the ideas on loss of nigrostriatal dopaminergic neurons in Parkinson's disease are particularly interesting and show how much Gerald Cohen appreciates that "hypotheses are nets: only he who casts will catch"!) and in relation to inflammation (with an illuminating delineation of the contribution of oxygen-centred radicals to various aspects of inflammation) and tumour promotion (prooxidant states probably promote initiated cells to neoplastic growth). The rapidly developing concept of post-ischæmic reperfusion injury (pp. 164–167) and the potential activation and involvement of neutrophils in hypoxic tissues (pp. 167–169) are ably summarized. That the lungs are particularly prone to oxidative (and other) damage by neutrophils is duly noted (also p. 371) though shock lung is not mentioned as such.

One may ask: Is oxygen *the* stress of life? This remains to be more clearly proven.

No extravagant claims are made in this book; the preface describes the book as “an in-depth account of present knowledge and current problems in the field of oxygen-related damage in biological systems”. The depth of investigation is reasonable and uniformly maintained. With a helpful index, this book is stimulating and deserves to be widely read.

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