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Book reviews

Reactive Oxygen Species in Biological Systems: An Interdisciplinary Approach

D. L. Gilbert & C. A. Colton, Kluwer Academic/Plenum Publishers, New York, 1999, xxv + 707 pp, £97.50, ISBN 0-306-45756-3

Recognition of the importance in biological systems of reactive oxygen species (ROS), which include free radicals, peroxides, singlet oxygen, ozone, and nitrogen monoxide and dioxide free radicals, has led to considerable interest and intense research in this constantly expanding area. This volume aims to provide a concise, yet comprehensive, overview of this important field and focuses on three main areas, namely the destruction of cellular function by ROS resulting in pathological states, the protection of an organism by ROS against invading organisms that cause infection, and the role of ROS in normal physiological processes.

'Reactive Oxygen Species in Biological Systems' is essentially divided into eight parts, with a total of 28 chapters. Part I contains two introductory chapters, which provide the essential background information on the history and chemistry of ROS which is required for better comprehension of future chapters. The six chapters that comprise Part II focus upon general biochemistry and molecular biology of ROS, and include specific chapters on the production of ROS by mitochondria, the molecular biology of antioxidant enzyme activation, and inflammation regulation of manganese superoxide dismutase. Part III on nitrogen reactive species covers the importance of nitrogen radicals, and includes chapters on nitric oxide synthase, the beneficial and deleterious effects of nitric oxide, and the protective role of nitroxides against oxidative stress. Environmental pro- and anti-oxidants, such as ozone, which filters out damaging UV radiation, are examined in Part IV. The damaging effects of ozone and nitrogen dioxide on biological organisms, and antioxidants in nutrition are also discussed. Internal pro- and anti-oxidants are covered in Part V. The antioxidant effects of lipid soluble ubiquinol and the hormone melatonin are presented, along with the ability of xanthine oxidase to contribute to a pro-oxidant condition in biological organisms.

Part VI of this volume explores ROS in specific tissues, such as plant tissue and nervous tissue, and discusses the production of ROS by phagocytes, spermatozoa and fertilised ova. Brain chemiluminescence and the role of ROS in neuronal function are also covered in this section, which leads nicely into part VII, which details pathological states and ageing. Specific chapters in this section focus upon Parkinson's disease, Alzheimer's disease, amyotrophic lateral sclerosis (Lou Gehrig's disease), and the oxidation of proteins in ageing. The volume concludes in part VIII with an overall summary chapter, which includes other topics not covered in the volume, such as the role of ROS in programmed cell death, cataracts, hypoxia, proxisomes, arachidonic acid and reperfusion injury.

In conclusion, 'Reactive Oxygen Species in Biological Systems' is a well written informative volume, that provides an excellent overview of the expanding area of ROS. It is therefore highly recommended to all individuals with research interests which include ROS.

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Comprehensive Organic Transformations: A Guide to Functional Group Preparations (2nd ed)

R. C. Larock, John Wiley & Sons, Inc., New York, 1999, xliii + 2583 pp., £96.99, ISBN 0-471-19031-4

Organic synthesis is a constantly evolving area, with new reagents and reactions being reported in the scientific literature on a regular basis. It has, therefore, become impossible for a practising organic chemist to keep abreast of all the latest synthetic organic methodologies and technologies at their disposal. It is the intention of this volume to provide a comprehensive, highly condensed, systematic collection of useful synthetic methodologies that is of direct practical use to not only the long term practitioner of organic synthesis, but also to the synthetic novice.

All presented reactions have been systematically organised according to synthetic target functionality, resulting