

BOOK REVIEWS

PHYSIOLOGICAL BASIS OF AGING AND GERIATRICS

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467 pages

Romans and even Greeks in ancient times associated aging with accumulative wisdom, serenity and leadership. Aging, however, also is related to frailty, decay and illnesses. The topic of aging is young in the Biological Sciences. Paola Timiras, professor of anatomy/physiology at Berkeley, undertook a successful endeavour to present recent advances in this interdisciplinary field. She and her coworkers and associates as well as colleagues from outside succeeded in presenting up-to-date articles on various aspects of aging and geriatrics. An indicator of the actuality of presentation is that most of the references in the book are from this decade.

The topics treated are organized into four Parts, General Perspectives, Molecular and Cellular Aging, Systemic and Organismic Aging, and Prevention and Rehabilitation.

The introductory part defines aging as a stage in the life cycle and provides demographic, comparative, and differential aging as concept. General theories of aging are given by Dr. Sharma from the Fels Research Institute, School of Medicine, Temple University, Philadelphia. This introductory chapter provides the keywords that are used in later chapters, including molecular theories with codon restriction, somatic mutation, error theory, gene regulation theory and cellular theories and the terms of wear and tear, age pigments, free radical theories, cross-linking theories and, finally, system level theories such as neuroendocrine control theory and immunologic theory. Already here it becomes clear that aging is multi-faceted and many aspects have to be considered.

These concepts are spelled out in the next chapters, one again by Dr. Sharma. The oxygen radical chapter is provided by Dr. Rolf Mehlhorn from the Department of Anatomy/Physiology in Berkeley. This chapter, of course, is to the point for readers of this journal, and in 15 pages provides a brief assessment of oxygen radical involvement in aging. After addressing the antioxidants involved and the reactions in different cells, the discussion comes to a more conservative conclusion that the free radical theory of aging is faced with several serious difficulties that cast doubt on its validity as formulated. These include: 1. the failure of antioxidant therapy to significantly extend the maximum lifespan of mammals; 2. The fact that the only effective strategy for lifespan extension, i.e. caloric restriction, has not been successfully correlated with metabolic rates or with rates of endogenous radical production; and 3. the failure to demonstrate an expected oxygen concentration effect on the proliferative potential in the cultured cell aging model, assuming some relevance of this model to *in vivo* aging. Therefore, the initial high hopes of a major contribution of the field of free radicals to aging still have to be held high, if one does not feel that it is time to turn to other crucial parameters.

Such are given by the discussion by Hal Sternberg on the immune system, e.g. autoimmune disease, thymus and thymosins and other aspects of immunological senescence.

‘ The systematic treatment of different organs and changes during lifespan comprises the major following part, and I will not discuss this in detail here.

The more provocative part is on prevention and rehabilitation. These include a section on pharmacokinetics and drug management in the elderly by Doherty Hudson, effect of diet on aging by Brian Merry and Anne Holehan, physiologic approach to rehabilitation medicine by Chang Hong and Jerome Tobis, and finally an agenda for healthful aging which bridges the literature to the layman. Here it is even notable that there is a section contributed by Paul Segall on future perspectives in biomedical gerontology: life extension; key words here include cryopreservation, cloning, and other timely activities.

All in all, the book provides a refreshing presentation and is recommended for reading.

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OXYGEN RADICALS AND TISSUE INJURY

Proceedings of an Upjohn Symposium, Augusta, Michigan, April 1987.

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This monograph reports the proceedings of a conference to discuss oxygen radicals and tissue injury in the context of scientific approaches to the development of therapeutic interventions. Papers were presented by Fridovich, Gutteridge, Borg, Aust, Fisher, Babior, Cochrane, Jacob, Simpson, Watson, Ginsberg, Hall, Braugher, Ward, Johnson, Clark and Cohen, under the Chairmanship of Barry Halliwell. Anyone remotely interested in this field of research will regret that space limitations prohibited open attendance at what was clearly a very stimulating conference, when they read this volume.

However, one might well argue that the quality of the papers included are such that it was not necessary to have attended the meeting to appreciate the full flavour of the spoken presentations.

The monograph starts with a truly innovative survey of superoxide radical and its *raison d'être*. We are then taken via the role of the ubiquitous iron and the ferryl vs hydroxyl debate to intracellular and extracellular production of oxygen radicals: the phagocyte becomes the major star on the prime stages of reperfusion injury (myocardial, cerebrovascular, neuronal, kidney), endothelial cell damage and immune complex formation.

Eventually we reach the point at which we realise that Fridovich's introduction to the proceedings should also be suitably placed as the conclusion to this monograph.

Every chapter is an extremely worthwhile experience. Even those who were given the mantle to review the well-staged scenarios in the introductory section set about their task with new ideas and approaches to the problem. The only disappointment was that Drs. Cochrane et al and Fisher did not give us a more extensive exposure to intracellular events in oxidant injury.

Although it is now 2 years since this conference took place, it will still remain a valuable addition to the rapidly growing collection of proceedings of conferences and books concerning free radical involvement in tissue injury. Only the very few who are experts in all aspects of the research discussed here can afford to leave it from their own collection.

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