

## Book Reviews

**ALFRED BENZON SYMPOSIUM 44  
MOLECULAR BIOLOGY OF AGING,**  
EDS. VILHELM A. BOHR, BRIAN F.C. CLARK  
AND TINNA STEVNSNER,  
COPENHAGEN, MUNKSGAARD,  
399 PP., 1999, ISBN 87-16-12176-7.

The volume *Molecular Biology of Aging* constitutes the *Proceedings of the 44th Alfred Benzon Symposium*, held at the Royal Danish Academy of Sciences and Letters on June 14–18, 1998. Participants in the meeting included scientists who focus on mechanisms underlying the process of aging and of age-related diseases such as Alzheimer's dementia, cancer and atherosclerosis.

Although the editors highlight the presence of clinical and epidemiological data in the book, the large majority of reported studies were performed in culture cell systems, in simple organisms (protozoa, yeasts) and in animal models (mice, avian), investigating genetics, signal transduction pathways and mechanisms of DNA damage and repair. The book is organized in eight sections, with a total of 21 chapters. The first section describes genetic approaches to aging research and recent work regarding genetics of aging, whereas in the second section aspects of replicative senescence are explored. The third section is dedicated to important biomarkers of aging, including those related to oxidative stress, altered mitochondrial bioenergetics, and to the function of telomeres and telomerases. Three sections (IV, V and VI) are devoted to the role of DNA damage

and repair during aging, followed by an update of some aspects of signal transduction and intervention in advanced age. The volume closes with a section on population studies and a look to future modalities of aging.

Some questions arise while reading the chapters: Do *gerontogenes* similar to those present in *Caenorhabditis elegans* exist also in humans? Will telomerases be used to "immortalize" human life, since they have been shown to be able to immortalize normal human cells? Throughout the book, and especially at the end, the reader learns what has been done so far to manipulate the aging rate of different organisms and how we should expect to age in the future on the basis of biodemographic projections.

The major thrust of the book relates to aspects of genetics and biomarkers of aging, replicative senescence, age-related DNA changes, damage and repair which have been recently studied in human subjects. In particular, biogerontologists have been choosing premature aging disorders such as Werner's syndrome and Hutchinson–Gilford's disease (commonly known as progeria) as potentially having similar mechanisms to those underlying normal aging. With the lengthening of the human lifespan in the last decades, however, it is now possible for scientists of developed countries to study very old *healthy* subjects (such as healthy centenarians) in order to better understand mechanisms underlying longevity.

The volume contains many good quality illustrations and very recent references. Furthermore,

interpretation of reported results is facilitated by edited discussions between participants, drafted by the chairman of each session. A subject index at the end would have been helpful.

Taken together, this book provides a high-quality presentation of current knowledge of this important biomedical field, and we can recommend it highly.

Maria Cristina Polidori and  
Helmut Sies

### PHYTOCHEMICALS

#### A NEW PARADIGM

EDS. W.R. BIDLACK, S.T. OMAYE,  
M.S. MESKIN AND D. JÄHRER  
TECHNOMIC PUBLISHING CO LTD,  
LANCASTER, USA, 1998

This is a very timely book. In an excellent editorial, Bidlack lists all the areas of research that need to be pursued both to determine the mechanisms by which fruits and vegetables protect humans against age-related diseases, and also to deliver the science required to support the development of functional foods.

Chapter 1 reviews the evidence that a diet rich in plants leads to lower cancer incidence. It is generally well-written but discussion of the ATBC and CARET studies is somewhat naive. It is unlikely that deleterious effects of  $\beta$ -carotene are due to pro-oxidant actions "under conditions of high  $O_2$  tension which would occur among smokers". Chapter 2 is a nicely-written account of the principles of oxidative stress and antioxidant action. It also contains a succinct description of the French paradox. Chapter 3 is a useful account of tocotrienols, the usually-neglected partners of the tocopherols in forming the vitamin E activity of foods, especially their influence on plasma cholesterol levels. Chapter 4 is a good review of interactions between the various anti-

oxidants. The focus is on ascorbate,  $\alpha$ -tocopherol and  $\beta$ -carotene but recent studies on the "antioxidant hierarchy" of carotenoids and on interactions of flavonoid phenoxyl radicals with ascorbate and tocopherol might usefully have been included. More attention might perhaps have been given to the mechanisms behind the alleged "pro-oxidant" effects of vitamin E.

Chapter 5 is devoted to carotenoids and contains valuable data on their concentrations in human tissues and body fluids, including breast milk. It is followed by an equally-useful chapter on interactions between carotenoids, especially during uptake from the gut. *Dunaliella*, a popular source of  $\beta$ -carotene for supplements, is the focus of Chapter 7.  $\beta$ -Carotene has been used for years to colour foods and as a source of vitamin A and has recently been promoted as an antioxidant supplement, although evidence supporting its antioxidant properties in the human body is remarkably sparse (page 124). Chapter 8 is a good summary of the organosulphur and organoselenium constituents of garlic and onions, including thiosulphinates, selenocysteine, and selenomethionine. It also contains a pertinent comment (page 138) on the garlic preparations widely sold in pharmacies and health-food stores. Fungal chemistry is the topic of Chapter 9 – "over the millenia, our ancestors have found nourishment, beauty, pleasure, spiritual communion, cultural traditions and medical benefits in fungi". Most of these statements are exemplified, especially in relation to the Shiitake mushroom *Lentinula edodes*.

I enjoyed this book and learned something from every chapter. Perhaps Japanese quail, who are prone to atherosclerosis (page 39) should be fed on Shiitake mushrooms (page 154). In *Anthony and Cleopatra*, Shakespeare wrote "the tears live in an onion that should water this sorrow". Now I know the chemistry involved (page 132).

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