

Preface

Human race has been experiencing an explosion in the middle and old age population over the last century. One does desire to live long, but not many years in disability. Hence, the goal of biomedical gerontology is to achieve quality healthy life rather than merely adding years to one's life. With advancing age, senior citizens suffer from loss of muscle strength and function that causes hardship in walking and climbing and often requires living assistance. Aging per se is not a disease, however, it is a potential risk factor for various diseases including neurodegenerative (Alzheimer's and Parkinson's), cancer, cardiovascular, ocular, pulmonary, and osteoporosis. Hence, understanding the mechanisms involved in the causation of aging process will help devise interventions to postpone age-related diseases and provide healthy aging. A pivotal goal of aging research is not only to maximize human life span, but also to improve the quality of life with advancing age.

Aging results from multiple interactions between genes and environment. Hence, it is under the strong influence of nature and nurture. Studies in human and other experimental animals indicate that right nutrition and regular physical exercise contribute remarkably to enhance health span and prolong life span as well. Preventive and rehabilitative strategies might help elderly maintain active lifestyle and preserve intellectual and functional competence in old age. One of the well-studied strategies is the dietary restriction that has been shown to increase both mean and maximum life span together with reduction in morbidity and increased quality of life.

Advancement in the field of biology with revised central dogma of molecular biology and RNA world has lead to newer concepts and approaches to explore the interventional strategies in increasing healthy quality life. In the era of "omics," one can use metabolomic, functional genomic, and proteomic approaches to understand the mechanisms of aging process and design ways to modulate such processes to achieve healthy aging. Several strategies are being employed to achieve this goal by biomedical gerontologists such as macronutrients and micronutrients, vitamins, phytochemicals, and dietary restriction.

Our venture to produce this book is to put together various topics which are useful in finding causation and mechanisms of aging in various experimental animals including humans. Attempts have also been made to include the work on various interventional strategies to achieve healthy aging. It all originated from the International conference on Engaging and Empowering the Elderly and 17th Biennial Conference of Association of Gerontology (India) held at Thiruvananthapuram during September 15–16, 2014. In addition, we have tried to include some additional relevant topics for larger group of readers in the field of biomedical gerontology to add intellectual understanding among researchers of healthful aging.

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