

RESEARCH AND PERSPECTIVES IN ENDOCRINE INTERACTIONS

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Endocrine Aspects of Successful Aging: Genes, Hormones and Lifestyles

With 40 Figures and 2 Tables



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Preface

Endocrine Aspects of Successful Aging: of Genes, Hormones and Lifestyles

At the beginning of the 20th century, life expectancy at birth in North America and Western Europe was around 50 years of age. Nowadays, women have gained more than 30 years of age and men are trailing closer. Each year, new born babies still gain 3 months of life expectancy and sexagenarians are likely to live twenty more years. In 2025, the world population of people over sixty will reach 1.2 billion (14% of total) vs 0.2 billion in 1950 (8% of total). However, according to several sociologists, such as Louis Chauvel from “l’Institut des hautes études de Paris (IEP)”, the notion of a “greying society” is not entirely adequate since aging people are physically and socially younger and more active for a longer time. Of course, the other side of the medal is to tackle the challenge of preventing age-associated chronic diseases (osteoarthritis, osteoporosis, neurodegenerative diseases, diabetes, obesity, etc ...).

This book is based on presentations made at the occasion of the second meeting of the series Research and Perspectives in Endocrine Interactions, organized in Paris by the Foundation IPSEN on December 3, 2002. The first goal of this meeting, and therefore of the book, was to review the extensive field of research on neuroendocrine aging which ranges on millions of years of Evolution. Indeed, many data gathered on simple organisms such as the nematode *C. Elegans* appears to be relevant in more complex mammalian models. One good example of such a conservation is the common involvement of the Insulin-like Growth Factor-I (IGF-I) / Insulin pathway in the control of energy expenditure and longevity from nematodes to mice and, possibly to Man (see contributions by Ruvkun et al; Bartke et al; Holzenberger et al; Janssen et al). Another good example is the clock gene arrays which contribute to the control of circadian rhythmicity across evolution (see contribution by Sassone-Corsi). The second goal was to provide a state of the Art report on human aging and the different tentative hormonal substitution strategies in order to postpone the effect of age in women (Estrogens, see contributions by Wise and Dubal and Sherwin), men (Testosterone, Basin et al), or in both genders (Growth Hormone, Shalet; Steroids, Schumacher; Finch et al. Finally, aging is one of the most complex biological processes determined by the interactions between genetic and environmental factors such as stress (see contribution by Pruessner et al). The evolutionary biological theory of aging implies that natural selection pressure is lower in low hazard ecological niches from which longer-lived species are more likely to emerge. In addition, gene alleles

which are functionally active after the reproductive period will not be submitted to natural selection. Thus, genetic epidemiological analyses with a candidate endocrine gene approach appear as a good strategies to evaluate phenotypic endpoints of interest in a given population (see contributions by Uitterlinden et al; Jiang and Huhtaniemi; van den Beld et al).

In conclusion, we hope that this book testifies that the Neuroendocrinology of Aging has gone a long way since 1888 when Charles Edouard Brown-Sequard, at the age of 72, injected himself with testicular extracts in order to regain his youth. As indicated by Jonathan Swift when he turned sixty: "Every man desires to live long but no man wishes to be old".

September 2003

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