

Preface

We are delighted to present this book in which our contributors revisit more than 55 years of research based on the discovery that cultured normal cells are mortal and the interpretation that this phenomenon is associated with the origins of ageing. At the same time, and in the same laboratory, it was also discovered that the only immortal cells in vitro were those with the properties of cancer cells. The mortality of normal cells and the immortality of cancer cells were also reported to have in vivo counterparts.

Until these finding occurred the focus of research on ageing was mostly descriptive and the cause of ageing was thought to be driven by extracellular events like wear and tear, radiation and stress. With the discoveries described above the focus on the cause of ageing for the next decades was redirected toward intracellular events. Thus began the field of cytogerontology.

The origin of age changes has more recently evolved to include fundamental events that occur at the molecular level and that involve the flow of energy. The serial replication of normal cells in vitro is accompanied by progressive changes which eventually reach an irreversible state of growth and proliferative arrest, also known as replicative senescence.

This book covers the origins and subsequent history of research results in which attempts have been made to clarify issues related to cellular ageing, senescence, and age-related pathologies including cancer. The book is organized into five sections: (1) history and origins; (2) serial passaging and progressive aging; (3) cell cycle arrest and senescence; (4) system modulation; and (5) recapitulation and future expectations. These issues are discussed by leading thinkers and researchers in biogerontology and cytogerontology. We are confident that this collection of articles provides state-of-the-art information.

We hope that this book will encourage students, teachers, health care professionals and others interested in the biology of ageing to explore the fascinating and challenging question of why and how our cells age, and what can and cannot be done about it.

Aarhus, Denmark
The Sea Ranch, CA, USA

Suresh I.S. Rattan
Leonard Hayflick

Cellular Ageing and Replicative Senescence

Rattan, S.; Hayflick, L. (Eds.)

2016, VIII, 364 p. 27 illus., 18 illus. in color., Hardcover

ISBN: 978-3-319-26237-6