Microbiology and Aging
Steven L. Percival
Editor

Microbiology and Aging

Clinical Manifestations

Springer
I would like to dedicate this book to Carol, Alex and Tom and my Mum and Dad.
‘The cycle of life is a journey of microbiological intrigue’
Preface

The world’s population is estimated to reach 8.9 billion by 2050 with 370 million people of 80 years of age or older. Ageing is an incurable disease and defined as the ‘deregulation of biochemical processes important for life’, but for the purpose of this book, ageing is better defined as the biological process of growing older. Ageing is part of natural human development.

As you will see throughout this book, the microbiological burden on the host is enormous and clinically significant, and will undoubtedly have a role to play in the ageing process. As humans are living longer, there is a greater propensity to infection. This risk is substantially heightened in elderly individuals who are predisposed to infection. While the process of ageing and its effects on the host’s microbiology are poorly documented and researched, data obtained from gut studies have shown that microbiological changes take place over time suggesting significance to the host. Do the microbiological changes that occur within and upon the host influence the process of ageing or is it the biological changes of the host that affects the microbiology? Does this therefore affect our propensity to disease? As the host’s microbiology changes with ageing, is this significantly beneficial or severely detrimental to the host? Are there ways of enhancing life expectancy by reducing certain bacteria from proliferating or conversely by enhancing the survival of beneficial bacteria?

This book considers the microbiology of the host in different regions of the body and how these vary in the different age groups. Chapter 1 of the book focuses on ageing theories with Chap. 2 considering the human indigenous flora and how this is affected during ageing. Chapter 3 highlights the main infections associated with an elderly population, while Chap. 4 reviews the process of skin ageing and its associated microbiology. Chapter 5 reviews the ageing lung and Chap. 6 reviews influenza in the elderly. Chapter 7 highlights the changes that occur in the oral microflora and host defences with advanced age with Chap. 8 reviewing the influence of the gut microbiota with ageing. Chapter 8 focuses on the gut and its associated immunity. The remaining four chapters of the book consider clostridium and the ageing gut, Helicobacter pylori and the hygiene hypothesis and the benefits of probiotics. The microbiology theory of autism in children is reviewed in
Chap. 13. The final chapter of the book examines how the beneficial microbiology of the host leads to human decomposition.

This book encompasses a collection of reviews that highlight the significance of and the crucial role that microorganisms play in the human life cycle.
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