

Notes on Contributors vii

Preface to the First Edition ix

Preface to the Ninth Edition x

About the Companion Website xi

Part 1 Introducing Pharmaceutical Microbiology 1

1 Introduction to Pharmaceutical Microbiology 3

Brendan F. Gilmore and Stephen P. Denyer

Part 2 Biology of Microorganisms 11

2 Fundamental Features of Microbiology 13

Norman Hodges and Stephen P. Denyer

3 Bacteria 27

David Allison

4 Fungi 47

Kevin Kavanagh

5 Viruses and Other Acellular Infectious Agents: Characteristics and Control 63

Timofey Skvortsov and Jean-Yves Maillard

6 Protozoa 98

Tim Paget

Part 3 Pathogens and Host Response 121

7 Principles of Microbial Pathogenicity and Epidemiology 123

David Allison and Andrew J. McBain

8 Microbial Biofilms: Consequences for Health 135

Brendan F. Gilmore

9 Immunology 147

Mark Gumbleton and Mathew W. Smith

10 Vaccination and Immunisation 174

Gavin J. Humphreys and Andrew J. McBain

Part 4 Prescribing Therapeutics and Infection Control 191

11 Antibiotics and Synthetic Antimicrobial Agents: Their Properties and Uses 193

Brendan F. Gilmore

12 Mechanisms of Action of Antibiotics and Synthetic Anti-infective Agents 232

Peter Lambert

13 Bacterial Resistance to Antibiotics 249

Brendan F. Gilmore and Stephen P. Denyer

14 Clinical Uses of Antimicrobial Drugs 272

Hayley Wickens and Conor Jamieson

15 Antibiotic Prescribing and Antimicrobial Stewardship 289

Rebecca Craig

16 Infection Prevention and Control: Healthcare-associated Infection 304

Elaine Cloutman-Green

Part 5 Contamination and Contamination Control 321

17 Microbial Spoilage, Infection Risk and Contamination Control 323

Rosamund M. Baird

18 Chemical Disinfectants, Antiseptics and Preservatives 343

Sean P. Gorman and Brendan F. Gilmore

19 Laboratory Evaluation of Antimicrobial Agents 365

Brendan F. Gilmore and Sean P. Gorman

20 Microbicides: Mode of Action and Resistance 385

Stephen P. Denyer and Jean-Yves Maillard

21 Sterilisation Procedures and Sterility Assurance 403

Alistair K. Brown and Stephen P. Denyer

Part 6 Pharmaceutical Production 433

22 Sterile Pharmaceutical Products and Principles of Good Manufacturing Practice 435

Tim Sandle

23 The Manufacture and Quality Control of Immunological Products 462

Tim Sandle

24 Recombinant DNA Technology 480

Miguel Cámara and Stephan Heeb

Part 7 Current Trends and New Directions 507

25 The Wider Contribution of Microbiology to the Pharmaceutical Sciences 509

Mathew W. Smith, James C. Birchall and Sion A. Coulman

26 Alternative Strategies to Antibiotics: Priorities for Development 529

Brendan F. Gilmore

Index 544