

Contents

To the Student...A Word from Lansing Prescott v

1 The History and Scope of Microbiology 1

2 The Study of Microbial Structure: Microscopy and Specimen Preparation 8

3 Prokaryotic Cell Structure and Function 18

4 Eucaryotic Cell Structure and Function 36

5 Microbial Nutrition 46

6 Microbial Growth 56

7 Control of Microorganisms by Physical and Chemical Agents 70

8 Metabolism: Energy, Enzymes, and Regulation 77

9 Metabolism: Energy Release and Conservation 88

10 Metabolism: The Use of Energy in Biosynthesis 100

11 Microbial Genetics: Gene Structure, Replication, and Expression 109

12 Microbial Genetics: Regulation of Gene Expression 125

13 Microbial Genetics: Mechanisms of Genetic Variation 136

14 Recombinant DNA Technology 151

15 Microbial Genomics 158

16 The Viruses: Introduction and General Characteristics 165

17 The Viruses: Viruses of Bacteria and *Archaea* 173

18 The Viruses: Eucaryotic Viruses and Other Acellular Infectious Agents 182

19 Microbial Evolution, Taxonomy, and Diversity 192

20 The *Archaea* 202

21 Bacteria: The Deinococci and Nonproteobacteria Gram Negatives 210

22 Bacteria: The Proteobacteria 220

23 Bacteria: The Low G + C Gram Positives	231
24 Bacteria: The High G + C Gram Positives	239
25 The Protists	247
26 The Fungi (Eumycota)	259
27 Biochemical Cycling and Introductory Microbial Ecology	267
28 Microorganisms in Marine and Freshwater Environments	277
29 Microorganisms in Terrestrial Environments	285
30 Microbial Interactions	296
31 Nonspecific (Innate) Host Resistance	306
32 Specific (Adaptive) Immunity	317
33 Pathogenicity of Microorganisms	332
34 Antimicrobial Chemotherapy	342
35 Clinical Microbiology and Immunology	350
36 The Epidemiology of Infectious Disease	359
37 Human Diseases Caused by Viruses and Prions	371
38 Human Diseases Caused by Bacteria	385
39 Human Diseases Caused by Fungi and Protists	405
40 Microbiology of Food	413
41 Applied and Industrial Microbiology	423