



Basic Principles in the Diagnosis and Management of Infectious Diseases

SECTION A

MICROBIAL PATHOGENESIS

1 A Molecular Perspective of Microbial Pathogenicity 3

DAVID A. RELMAN | STANLEY FALKOW

2 Microbial Adherence 15

WILLIAM A. PETRI, JR. | BARBARA J. MANN | CHRISTOPHER D. HUSTON

3 Toxins 27

ERIK L. HEWLETT | MOLLY A. HUGHES

SECTION B

HOST DEFENSE MECHANISMS

4 Innate (General or Nonspecific) Host Defense Mechanisms 37

CARL W. DIEFFENBACH | EDMUND C. TRAMONT | SUSAN F. PLAEGER

5 Human Genetics and Infection 49

ADRIAN V. S. HILL

6 Antibodies 59

HOLLY H. BIRDSALL

7 Complement 77

PETER DENSEN

8 Granulocytic Phagocytes 99

WILLIAM M. NAUSEEF | ROBERT A. CLARK

9 Cell-Mediated Defense against Infection 129

MICHAEL S. GLICKMAN | ERIC G. PAMER

10 Nutrition, Immunity, and Infection 151

CARYN GEE MORSE | KEVIN P. HIGH

11 Prebiotics, Probiotics, and Synbiotics 161

SHERVIN RABIZADEH | MARK A. MILLER | CYNTHIA L. SEARS

12 Evaluation of the Patient with Suspected Immunodeficiency 167

STEVEN M. HOLLAND | JOHN I. GALLIN

SECTION C

EPIDEMIOLOGY OF INFECTIOUS DISEASES

13 Epidemiologic Principles 179

MICHAEL T. OSTERHOLM | CRAIG W. HEDBERG

14 Outbreak Investigation 193

ANDRES G. LESCANO | JOEL M. MONTGOMERY | DAVID L. BLAZES

15 Emerging and Reemerging Infectious Disease Threats 199

RIMA F. KHABBAZ | STEPHEN M. OSTROFF | JAMES W. LEDUC |
ROBIN MOSELEY | JAMES M. HUGHES

16 Hospital Preparedness for Emerging and Highly Contagious Infectious Diseases: Getting Ready for the Next Epidemic or Pandemic 221

LAURA M. LEE | DAVID K. HENDERSON

SECTION D

CLINICAL MICROBIOLOGY

17 The Clinician and the Microbiology Laboratory 233

PATRICK R. MURRAY | FRANK G. WITEBSKY

SECTION E

ANTI-INFECTIVE THERAPY

18 Principles of Anti-infective Therapy 267

SATISH K. PILLAI | GEORGE M. ELIOPOULOS | ROBERT C. MOELLERING, JR.

19 Molecular Mechanisms of Antibiotic Resistance in Bacteria 279

STEVEN M. OPAL | AURORA POP-VICAS

20 Pharmacokinetics and Pharmacodynamics of Anti-infective Agents 297

GUY W. AMSDEN | CHARLES H. BALLOW |
JOSEPH S. BERTINO, JR. | ANGELA D. M. KASHUBA

21 Penicillins and β -Lactam Inhibitors 309

HENRY F. CHAMBERS

22 Cephalosporins 323

DAVID R. ANDES | WILLIAM A. CRAIG

23 Carbapenems and Monobactams 341

HENRY F. CHAMBERS

24 β -Lactam Allergy 347

MICHAEL E. WEISS | N. FRANKLIN ADKINSON, JR.

25 Fusidic Acid 355

LIONEL A. MANDELL

26 Aminoglycosides 359

DAVID N. GILBERT | JAMES E. LEGGETT

27 Tetracyclines and Chloramphenicol 385

MIRELLA SALVATORE | BURT R. MEYERS

28 Rifamycins 403

DAVID P. CALFEE

29 Metronidazole 419

MIRELLA SALVATORE | BURT R. MEYERS

30 Macrolides, Clindamycin, and Ketolides 427

SUMATHI SIVAPALASINGAM | NEAL H. STEIGBIGEL

- 31 Glycopeptides (Vancomycin and Teicoplanin), Streptogramins (Quinupristin-Dalfopristin), and Lipopeptides (Daptomycin) 449**
BARBARA E. MURRAY | ESTEBAN C. NANNINI
- 32 Polymyxins (Polymyxin B and Colistin) 469**
KEITH S. KAYE | DONALD KAYE
- 33 Linezolid and Other Oxazolidinones 471**
GERALD R. DONOWITZ | HEATHER L. COX
- 34 Sulfonamides and Trimethoprim 475**
STEPHEN H. ZINNER | KENNETH H. MAYER
- 35 Quinolones 487**
DAVID C. HOOPER | JACOB STRAHILEVITZ
- 36 Novel Antibiotics 511**
LIONEL A. MANDELL
- 37 Urinary Tract Agents: Nitrofurantoin and Methenamine 515**
DAVID C. HOOPER
- 38 Topical Antibacterials 521**
JUDITH A. O'DONNELL | STEVEN P. GELONE
- 39 Antimycobacterial Agents 533**
RICHARD J. WALLACE, JR. | DAVID E. GRIFFITH
- 40 Systemic Antifungal Agents 549**
JOHN H. REX | DAVID A. STEVENS
- 41 Antiviral Drugs (Other Than Antiretrovirals) 565**
FRED Y. AOKI | FREDERICK G. HAYDEN | RAPHAEL DOLIN
- 42 Immunomodulators 611**
ANDREA V. PAGE | W. CONRAD LILES
- 43 Hyperbaric Oxygen 625**
RONALD P. RABINOWITZ | ELLIS S. CAPLAN
- 44 Agents Active against Parasites and *Pneumocystis* 631**
THOMAS A. MOORE
- 45 Alternative Medicines for Infectious Diseases 669**
JONATHAN D. BERMAN
- 46 Antimicrobial Stewardship 677**
RONALD E. POLK | NEIL O. FISHMAN
- 47 Interpreting the Results of Clinical Trials of Antimicrobial Agents 687**
JOHN H. POWERS
- 48 Outpatient Parenteral Antimicrobial Therapy 699**
ALAN D. TICE
- 49 Tables of Antimicrobial Agent Pharmacology 705**
GUY W. AMSDEN



Major Clinical Syndromes

SECTION A FEVER

- 50 Temperature Regulation and the Pathogenesis of Fever 765**
PHILIP A. MACKOWIAK

51 Fever of Unknown Origin 779

PHILIP A. MACKOWIAK | DAVID T. DURACK

52 The Acutely Ill Patient with Fever and Rash 791

DAVID J. WEBER | MYRON S. COHEN | DEAN S. MORRELL |
WILLIAM A. RUTALA

SECTION B

UPPER RESPIRATORY TRACT INFECTIONS

53 The Common Cold 809

RONALD B. TURNER

54 Pharyngitis 815

MARY T. CASERTA | ANTHONY R. FLORES

55 Acute Laryngitis 823

MARY T. CASERTA

56 Acute Laryngotracheobronchitis (Croup) 825

CAROLINE BREESE HALL | JOHN T. McBRIDE

57 Otitis Externa, Otitis Media, and Mastoiditis 831

JEROME O. KLEIN

58 Sinusitis 839

GREGORY P. DEMURI | ELLEN R. WALD

59 Epiglottitis 851

JAMES E. BURNS | J. OWEN HENDLEY

**60 Infections of the Oral Cavity, Neck,
and Head 855**

ANTHONY W. CHOW

SECTION C

PLEUROPULMONARY AND BRONCHIAL INFECTIONS

61 Acute Bronchitis 873

EDWARD E. WALSH

**62 Chronic Obstructive Pulmonary Disease and Acute
Exacerbations 877**

ANTONELLO PUNTURIERI | GAIL G. WEINMANN |
HERBERT Y. REYNOLDS

63 Bronchiolitis 885

CAROLINE BREESE HALL | JOHN T. McBRIDE

64 Acute Pneumonia 891

GERALD R. DONOWITZ

65 Pleural Effusion and Empyema 917

EDWARD J. SEPTIMUS

66 Bacterial Lung Abscess 925

BENNETT LORBER

67 Chronic Pneumonia 931

PETER G. PAPPAS

68 Cystic Fibrosis 947

SCOTT H. DONALDSON | MATTHEW C. WOLFGANG |
PETER H. GILLIGAN | RICHARD C. BOUCHER, JR.

SECTION D

URINARY TRACT INFECTIONS

69 Urinary Tract Infections 957

JACK D. SOBEL | DONALD KAYE

SECTION E

SEPSIS

70 Sepsis, Severe Sepsis, and Septic Shock 987

ROBERT S. MUNFORD | ANTHONY F. SUFFREDINI

SECTION F

INTRA-ABDOMINAL INFECTION

71 Peritonitis and Intraperitoneal Abscesses 1011

MATTHEW E. LEVISON | LARRY M. BUSH

72 Infections of the Liver and Biliary System 1035

COSTI D. SIFRI | LAWRENCE C. MADOFF

73 Pancreatic Infection 1045

MIRIAM J. BARON | LAWRENCE C. MADOFF

74 Splenic Abscess 1055

LAWRENCE C. MADOFF

75 Appendicitis 1059

COSTI D. SIFRI | LAWRENCE C. MADOFF

76 Diverticulitis and Typhlitis 1063

COSTI D. SIFRI | LAWRENCE C. MADOFF

SECTION G

CARDIOVASCULAR INFECTIONS

77 Endocarditis and Intravascular Infections 1067

VANCE G. FOWLER, JR. | W. MICHAEL SCHELD | ARNOLD S. BAYER

78 Prosthetic Valve Endocarditis 1113

BETTINA M. KNOLL | LARRY M. BADDOUR | WALTER R. WILSON

79 Infections of Nonvalvular Cardiovascular Devices 1127

M. RIZWAN SOHAIL | WALTER R. WILSON | LARRY M. BADDOUR

80 Prevention of Infective Endocarditis 1143

DAVID T. DURACK

81 Myocarditis and Pericarditis 1153

KIRK U. KNOWLTON | MARIA C. SAVOIA | MICHAEL N. OXMAN

82 Mediastinitis 1173

TREVOR C. VAN SCHOONEVELD | MARK E. RUPP

SECTION H

CENTRAL NERVOUS SYSTEM INFECTIONS

83 Approach to the Patient with Central Nervous System Infection 1183

ALLAN R. TUNKEL

84 Acute Meningitis 1189

ALLAN R. TUNKEL | DIEDERIK VAN DE BEEK | W. MICHAEL SCHELD

85 Cerebrospinal Fluid Shunt Infections 1231

ALLAN R. TUNKEL | JAMES M. DRAKE

86 Chronic Meningitis 1237

JOHN E. BENNETT

87 Encephalitis 1243

J. DAVID BECKHAM | KENNETH L. TYLER

88 Brain Abscess 1265

ALLAN R. TUNKEL

89 Subdural Empyema, Epidural Abscess, and Suppurative Intracranial Thrombophlebitis 1279
ALLAN R. TUNKEL

SECTION I
SKIN AND SOFT TISSUE INFECTIONS

- 90 Cellulitis, Necrotizing Fasciitis, and Subcutaneous Tissue Infections 1289**
MARK S. PASTERNAK | MORTON N. SWARTZ
- 91 Myositis and Myonecrosis 1313**
MARK S. PASTERNAK | MORTON N. SWARTZ
- 92 Lymphadenitis and Lymphangitis 1323**
MARK S. PASTERNAK | MORTON N. SWARTZ

SECTION J
GASTROINTESTINAL INFECTIONS AND FOOD POISONING

- 93 Principles and Syndromes of Enteric Infection 1335**
THEODORE S. STEINER | RICHARD L. GUERRANT
- 94 Esophagitis 1353**
PAUL S. GRAMAN
- 95 Nausea, Vomiting, and Noninflammatory Diarrhea 1359**
DAVID A. BOBAK | RICHARD L. GUERRANT
- 96 Antibiotic-Associated Colitis 1375**
NATHAN M. THIELMAN | KENNETH H. WILSON
- 97 Inflammatory Enteritides 1389**
ALDO A. M. LIMA | RICHARD L. GUERRANT
- 98 Enteric Fever and Other Causes of Abdominal Symptoms with Fever 1399**
NATHAN M. THIELMAN | JOHN A. CRUMP | RICHARD L. GUERRANT
- 99 Foodborne Disease 1413**
SAMIR V. SODHA | PATRICIA M. GRIFFIN | JAMES M. HUGHES
- 100 Tropical Sprue: Enteropathy 1429**
CHRISTINE A. WANKE
- 101 Whipple’s Disease 1435**
THOMAS MARTH | THOMAS SCHNEIDER

SECTION K
BONE AND JOINT INFECTIONS

- 102 Infectious Arthritis of Native Joints 1443**
CHRISTOPHER A. OHL
- 103 Osteomyelitis 1457**
ELIE F. BERBARI | JAMES M. STECKELBERG | DOUGLAS R. OSMON
- 104 Infections with Prostheses in Bones and Joints 1469**
BARRY D. BRAUSE

SECTION L
DISEASES OF THE REPRODUCTIVE ORGANS AND SEXUALLY TRANSMITTED DISEASES

- 105 Genital Skin and Mucous Membrane Lesions 1475**
MICHAEL H. AUGENBRAUN

106 Urethritis 1485
WILLIAM M. McCORMACK

107 Vulvovaginitis and Cervicitis 1495
WILLIAM M. McCORMACK

108 Infections of the Female Pelvis 1511
DAVID E. SOPER

109 Prostatitis, Epididymitis, and Orchitis 1521
JOHN N. KRIEGER

SECTION M EYE INFECTIONS

110 Microbial Conjunctivitis 1529
SCOTT D. BARNES | DEBORAH PAVAN-LANGSTON | DIMITRI T. AZAR

111 Microbial Keratitis 1539
SCOTT D. BARNES | DEBORAH PAVAN-LANGSTON | DIMITRI T. AZAR

112 Endophthalmitis 1553
MARLENE L. DURAND

113 Infectious Causes of Uveitis 1561
MARLENE L. DURAND

114 Periocular Infections 1569
MARLENE L. DURAND

SECTION N HEPATITIS

115 Acute Viral Hepatitis 1577
MICHAEL P. CURRY | SANJIV CHOPRA

116 Chronic Viral Hepatitis 1593
JULES L. DIENSTAG

SECTION O ACQUIRED IMMUNODEFICIENCY SYNDROME

117 Global Perspectives on Human Immunodeficiency Virus Infection and Acquired Immunodeficiency Syndrome 1619
PETER PIOT | MICHEL CARAEL

118 Epidemiology and Prevention of Acquired Immunodeficiency Syndrome and Human Immunodeficiency Virus Infection 1635
CARLOS DEL RIO | JAMES W. CURRAN

119 Diagnosis of Human Immunodeficiency Virus Infection 1663
ROBIN DEWAR | DEBORAH GOLDSTEIN | FRANK MALDARELLI

120 The Immunology of Human Immunodeficiency Virus Infection 1687

SUSAN MOIR | MARK CONNORS | ANTHONY S. FAUCI

121 General Clinical Manifestations of Human Immunodeficiency Virus Infection (Including the Acute Retroviral Syndrome and Oral, Cutaneous, Renal, Ocular, Metabolic, and Cardiac Diseases) 1705

TIMOTHY R. STERLING | RICHARD E. CHAISSON

122 Pulmonary Manifestations of Human Immunodeficiency Virus Infection 1727

PAUL E. SAX

123 Gastrointestinal and Hepatobiliary Manifestations of Human Immunodeficiency Virus Infection 1737

MARK S. SULKOWSKI

124 Neurologic Diseases Caused by Human Immunodeficiency Virus Type 1 and Opportunistic Infections 1745

IGOR J. KORALNIK

125 Malignant Diseases in Human Immunodeficiency Virus Infection 1765

PATRICIA A. CORNETT | PAUL A. VOLBERDING

126 Human Immunodeficiency Virus Infection in Women 1781

SUSAN E. COHN | REBECCA A. CLARK

127 Pediatric Human Immunodeficiency Virus Infection 1809

GEOFFREY A. WEINBERG | GEORGE K. SIBERRY

128 Antiretroviral Therapy for Human Immunodeficiency Virus Infection 1833

ATHE M. N. TSIBRIS | MARTIN S. HIRSCH

129 Management of Opportunistic Infections Associated with Human Immunodeficiency Virus Infection 1855

HENRY MASUR

130 Vaccines for Human Immunodeficiency Virus-1 Infection 1887

DAN H. BAROUCH | LINDSEY R. BADEN | RAPHAEL DOLIN

SECTION P

MISCELLANEOUS SYNDROMES

131 Chronic Fatigue Syndrome 1897

N. CARY ENGLEBERG

Index i



Infectious Diseases and Their Etiologic Agents

SECTION A

VIRAL DISEASES

- 132 Introduction to Viruses and Viral Diseases** 1907
JAMES D. CHAPPELL | TERENCE S. DERMODY
- 133 Orthopoxviruses: Vaccinia (Smallpox Vaccine), Variola (Smallpox), Monkeypox, and Cowpox** 1923
INGER K. DAMON
- 134 Other Poxviruses That Infect Humans: Parapoxviruses, Molluscum Contagiosum, and Yatapoxviruses** 1933
INGER K. DAMON
- 135 Introduction to Herpesviridae** 1937
JEFFREY I. COHEN
- 136 Herpes Simplex Virus** 1943
JOSHUA T. SCHIFFER | LAWRENCE COREY
- 137 Varicella-Zoster Virus** 1963
RICHARD J. WHITLEY
- 138 Cytomegalovirus** 1971
CLYDE S. CRUMPACKER II | JIE LIN ZHANG
- 139 Epstein-Barr Virus (Infectious Mononucleosis, Epstein-Barr Virus–Associated Malignant Diseases, and Other Diseases)** 1989
ERIC C. JOHANNSEN | KENNETH M. KAYE
- 140 Human Herpesvirus Types 6 and 7** 2011
JEFFREY I. COHEN
- 141 Kaposi's Sarcoma–Associated Herpesvirus (Human Herpesvirus Type 8)** 2017
KENNETH M. KAYE
- 142 Herpes B Virus** 2023
JEFFREY I. COHEN
- 143 Adenoviruses** 2027
ELIZABETH G. RHEE | DAN H. BAROUCH
- 144 Papillomaviruses** 2035
WILLIAM BONNEZ | RICHARD C. REICHMAN
- 145 JC, BK, and Other Polyomaviruses: Progressive Multifocal Leukoencephalopathy** 2051
C. SABRINA TAN | IGOR J. KORALNIK
- 146 Hepatitis B Virus and Hepatitis Delta Virus** 2059
MARGARET JAMES KOZIEL | CHLOE LYNN THIO
- 147 Human Parvoviruses, Including Parvovirus B19 and Human Bocavirus** 2087
KEVIN E. BROWN
- 148 Orthoreoviruses and Orbiviruses** 2097
ROBERTA L. DEBIASI | KENNETH L. TYLER
- 149 Coltiviruses and Seadornaviruses** 2101
ROBERTA L. DEBIASI | KENNETH L. TYLER

- 150 Rotaviruses 2105**
PHILIP R. DORMITZER
- 151 Alphaviruses 2117**
LEWIS MARKOFF
- 152 Rubella Virus (German Measles) 2127**
ANNE A. GERSHON
- 153 Flaviviruses (Yellow Fever, Dengue, Dengue Hemorrhagic Fever, Japanese Encephalitis, West Nile Encephalitis, St. Louis Encephalitis, Tick-Borne Encephalitis) 2133**
DAVID W. VAUGHN | ALAN BARRETT | TOM SOLOMON
- 154 Hepatitis C 2157**
STUART C. RAY | DAVID L. THOMAS
- 155 Coronaviruses, Including Severe Acute Respiratory Syndrome (SARS)-Associated Coronavirus 2187**
KENNETH MCINTOSH | STANLEY PERLMAN
- 156 Parainfluenza Viruses 2195**
PETER F. WRIGHT
- 157 Mumps Virus 2201**
NATHAN LITMAN | STEPHEN G. BAUM
- 158 Respiratory Syncytial Virus 2207**
CAROLINE BREESE HALL
- 159 Human Metapneumovirus 2223**
ANN R. FALSEY
- 160 Measles Virus (Rubeola) 2229**
ANNE A. GERSHON
- 161 Zoonotic Paramyxoviruses: Nipah, Hendra, and Menangle Viruses 2237**
ANNA R. THORNER | RAPHAEL DOLIN
- 162 Vesicular Stomatitis Virus and Related Vesiculoviruses 2245**
STEVEN M. FINE
- 163 Rhabdoviruses 2249**
SARICE L. BASSIN | CHARLES E. RUPPRECHT | THOMAS P. BLECK
- 164 Marburg and Ebola Virus Hemorrhagic Fevers 2259**
C. J. PETERS
- 165 Influenza Viruses, Including Avian Influenza and Swine Influenza 2265**
JOHN J. TREANOR
- 166 California Encephalitis, Hantavirus Pulmonary Syndrome, and Bunyavirid Hemorrhagic Fevers 2289**
C. J. PETERS
- 167 Lymphocytic Choriomeningitis Virus, Lassa Virus, and the South American Hemorrhagic Fevers 2295**
C. J. PETERS
- 168 Human T-Cell Lymphotropic Virus Types I and II 2303**
EDWARD L. MURPHY | HOPE H. BISWAS
- 169 Human Immunodeficiency Viruses 2323**
MARVIN S. REITZ, JR. | ROBERT C. GALLO

170 Introduction to the Enteroviruses and Parechoviruses 2337

JOHN F. MODLIN

171 Poliovirus 2345

JOHN F. MODLIN

172 Coxsackieviruses, Echoviruses, Newer Enteroviruses, and Parechoviruses 2353

JOHN F. MODLIN

173 Hepatitis A Virus 2367

ANNEMARIE WASLEY | STEPHEN M. FEINSTONE | BETH P. BELL

174 Rhinovirus 2389

RONALD B. TURNER

175 Noroviruses and Other Caliciviruses 2399

RAPHAEL DOLIN | JOHN J. TREANOR

176 Astroviruses and Picobirnaviruses 2407

RAPHAEL DOLIN | JOHN J. TREANOR

177 Hepatitis E Virus 2411

DAVID A. ANDERSON

SECTION B

PRION DISEASES

178 Prions and Prion Diseases of the Central Nervous System (Transmissible Neurodegenerative Diseases) 2423

PATRICK J. BOSQUE | KENNETH L. TYLER

SECTION C

CHLAMYDIAL DISEASES

179 Introduction to *Chlamydia* and *Chlamydophila* 2439

WALTER E. STAMM | BYRON E. BATTEIGER

180 *Chlamydia trachomatis* (Trachoma, Perinatal Infections, Lymphogranuloma Venereum, and Other Genital Infections) 2443

WALTER E. STAMM | BYRON E. BATTEIGER

181 *Chlamydophila (Chlamydia) psittaci* (Psittacosis) 2463

DAVID SCHLOSSBERG

182 *Chlamydophila (Chlamydia) pneumoniae* 2467

MARGARET R. HAMMERSCHLAG | STEPHAN A. KOHLHOFF | PETRA M. APFALTER

SECTION D

MYCOPLASMA DISEASES

183 Introduction to *Mycoplasma* and *Ureaplasma* 2477

STEPHEN G. BAUM

184 *Mycoplasma pneumoniae* and Atypical Pneumonia 2481

STEPHEN G. BAUM

185 Genital Mycoplasmas: *Mycoplasma genitalium*, *Mycoplasma hominis*, and *Ureaplasma* Species 2491

GEORGE E. KENNY

SECTION E

RICKETTSIOSES, EHRLICHIOSES, AND ANAPLASMOSIS

- 186 Introduction to Rickettsioses, Ehrlichioses, and Anaplasmosis** 2495
DIDIER RAOULT
- 187 *Rickettsia rickettsii* and Other Spotted Fever Group Rickettsiae (Rocky Mountain Spotted Fever and Other Spotted Fevers)** 2499
DAVID H. WALKER
- 188 *Rickettsia akari* (Rickettsialpox)** 2509
DIDIER RAOULT
- 189 *Coxiella burnetii* (Q Fever)** 2511
THOMAS J. MARRIE | DIDIER RAOULT
- 190 *Rickettsia prowazekii* (Epidemic or Louse-Borne Typhus)** 2521
DAVID H. WALKER | DIDIER RAOULT
- 191 *Rickettsia typhi* (Murine Typhus)** 2525
J. STEPHEN DUMLER | DAVID H. WALKER
- 192 *Orientia tsutsugamushi* (Scrub Typhus)** 2529
DIDIER RAOULT
- 193 *Ehrlichia chaffeensis* (Human Monocytotropic Ehrlichiosis), *Anaplasma phagocytophilum* (Human Granulocytotropic Anaplasmosis), and Other Anaplasmataceae** 2531
J. STEPHEN DUMLER | DAVID H. WALKER

SECTION F

BACTERIAL DISEASES

- 194 Introduction to Bacteria and Bacterial Diseases** 2539
MARTIN J. BLASER
- 195 *Staphylococcus aureus* (Including Staphylococcal Toxic Shock)** 2543
YOK-AI QUE | PHILIPPE MOREILLON
- 196 *Staphylococcus epidermidis* and Other Coagulase-Negative Staphylococci** 2579
MARK E. RUPP | PAUL D. FEY
- 197 Classification of Streptococci** 2591
KATHRYN L. RUOFF | ALAN L. BISNO
- 198 *Streptococcus pyogenes*** 2593
ALAN L. BISNO | DENNIS L. STEVENS
- 199 Nonsuppurative Poststreptococcal Sequelae: Rheumatic Fever and Glomerulonephritis** 2611
ALAN L. BISNO
- 200 *Streptococcus pneumoniae*** 2623
DANIEL M. MUSER
- 201 *Enterococcus* Species, *Streptococcus bovis* Group, and *Leuconostoc* Species** 2643
CESAR A. ARIAS | BARBARA E. MURRAY
- 202 *Streptococcus agalactiae* (Group B Streptococcus)** 2655
MORVEN S. EDWARDS | CAROL J. BAKER
- 203 Viridans Streptococci, Groups C and G Streptococci, and *Gemella* Species** 2667
SCOTT W. SINNER | ALLAN R. TUNKEL

- 250 *Mycobacterium tuberculosis* 3129**
DANIEL W. FITZGERALD | TIMOTHY R. STERLING | DAVID W. HAAS
- 251 *Mycobacterium leprae* 3165**
CYBÈLE A. RENAULT | JOEL D. ERNST
- 252 *Mycobacterium avium* Complex 3177**
FRED M. GORDIN | C. ROBERT HORSBURGH, JR.
- 253 Infections Due to Nontuberculous
Mycobacteria Other than *Mycobacterium
avium-intracellulare* 3191**
BARBARA A. BROWN-ELLIOTT | RICHARD J. WALLACE, JR.
- 254 *Nocardia* Species 3199**
TANIA C. SORRELL | DAVID H. MITCHELL | JONATHAN R.
IREDELL | SHARON C-A. CHEN
- 255 Agents of Actinomycosis 3209**
THOMAS A. RUSSO

SECTION G MYCOSES

- 256 Introduction to Mycoses 3221**
JOHN E. BENNETT
- 257 *Candida* Species 3225**
JOHN E. EDWARDS, JR.
- 258 *Aspergillus* Species 3241**
THOMAS F. PATTERSON
- 259 Agents of Mucormycosis and
Entomophthoromycosis 3257**
DIMITRIOS P. KONTOYIANNIS | RUSSELL E. LEWIS
- 260 *Sporothrix schenckii* 3271**
JOHN H. REX | PABLO C. OKHUYSEN
- 261 Agents of Chromoblastomycosis 3277**
DUANE R. HOSPENTHAL
- 262 Agents of Mycetoma 3281**
DUANE R. HOSPENTHAL
- 263 *Cryptococcus neoformans* 3287**
JOHN R. PERFECT
- 264 *Histoplasma capsulatum* 3305**
GEORGE S. DEEPE, JR.
- 265 *Blastomyces dermatitidis* 3319**
STANLEY W. CHAPMAN | DONNA C. SULLIVAN
- 266 *Coccidioides* Species 3333**
JOHN N. GALGIANI
- 267 Dermatophytosis and Other Superficial
Mycoses 3345**
RODERICK J. HAY
- 268 *Paracoccidioides brasiliensis* 3357**
ANGELA RESTREPO | ANGELA MARÍA TOBÓN
- 269 Uncommon Fungi and *Prototheca* 3365**
DUANE R. HOSPENTHAL
- 270 *Pneumocystis* Species 3377**
PETER D. WALZER | A. GEORGE SMULIAN
- 271 Microsporidiosis 3391**
LOUIS M. WEISS

SECTION H

PROTOZOAL DISEASES

- 272 Introduction to Protozoal Diseases** 3409
JONATHAN I. RAVDIN | WILLIAM A. PETRI, JR.
- 273 *Entamoeba* Species, Including Amebiasis** 3411
WILLIAM A. PETRI, JR. | RASHIDUL HAQUE
- 274 Free-Living Amebas** 3427
ANITA A. KOSHY | BRIAN G. BLACKBURN | UPINDER SINGH
- 275 *Plasmodium* Species (Malaria)** 3437
RICK M. FAIRHURST | THOMAS E. WELLEMS
- 276 *Leishmania* Species: Visceral (Kala-Azar), Cutaneous, and Mucosal Leishmaniasis** 3463
ALAN J. MAGILL
- 277 *Trypanosoma* Species (American Trypanosomiasis, Chagas' Disease): Biology of Trypanosomes** 3481
LOUIS V. KIRCHHOFF
- 278 Agents of African Trypanosomiasis (Sleeping Sickness)** 3489
LOUIS V. KIRCHHOFF
- 279 *Toxoplasma gondii*** 3495
JOSÉ G. MONTOYA | JOHN C. BOOTHROYD | JOSEPH A. KOVACS
- 280 *Giardia lamblia*** 3527
DAVID R. HILL | THEODORE E. NASH
- 281 *Trichomonas vaginalis*** 3535
JANE R. SCHWEBKE
- 282 *Babesia* Species** 3539
JEFFREY A. GELFAND | EDOUARD G. VANNIER
- 283 *Cryptosporidium* Species** 3547
A. CLINTON WHITE, JR.
- 284 *Cyclospora cayetanensis*, *Isospora belli*, *Sarcocystis* Species, *Balantidium coli*, and *Blastocystis hominis*** 3561
KATHRYN N. SUH | PHYLLIS KOZARSKY | JAY S. KEYSTONE

SECTION I

DISEASES DUE TO TOXIC ALGAE

- 285 Human Illness Associated with Harmful Algal Blooms** 3569
J. GLENN MORRIS, JR.

SECTION J

DISEASES DUE TO HELMINTHS

- 286 Introduction to Helminth Infections** 3573
JAMES H. MAGUIRE
- 287 Intestinal Nematodes (Roundworms)** 3577
JAMES H. MAGUIRE
- 288 Tissue Nematodes, Including Trichinellosis, Dracunculiasis, and the Filariases** 3587
JAMES W. KAZURA
- 289 Trematodes (Schistosomes and Other Flukes)** 3595
JAMES H. MAGUIRE

290 Cestodes (Tapeworms) 3607

CHARLES H. KING | JESSICA K. FAIRLEY

291 Visceral Larva Migrans and Other Unusual Helminth Infections 3617

THEODORE E. NASH

SECTION K

ECTOPARASITIC DISEASES

292 Introduction to Ectoparasitic Diseases 3625

JAMES H. DIAZ

293 Lice (Pediculosis) 3629

JAMES H. DIAZ

294 Scabies 3633

JAMES H. DIAZ

295 Myiasis and Tungiasis 3637

JAMES H. DIAZ

296 Mites, Including Chiggers 3643

JAMES H. DIAZ

297 Ticks, Including Tick Paralysis 3649

JAMES H. DIAZ

SECTION L

DISEASES OF UNKNOWN ETIOLOGY

298 Kawasaki Syndrome 3663

FRANK T. SAULSBURY

IV Special Problems

SECTION A

NOSOCOMIAL INFECTIONS

299 Organization for Infection Control 3669

MICHAEL B. EDMOND | RICHARD P. WENZEL

300 Isolation 3673

MICHAEL B. EDMOND | RICHARD P. WENZEL

301 Disinfection, Sterilization, and Control of Hospital Waste 3677

WILLIAM A. RUTALA | DAVID J. WEBER

302 Infections Caused by Percutaneous Intravascular Devices 3697

SUSAN E. BEEKMANN | DAVID K. HENDERSON

303 Nosocomial Pneumonia 3717

DONALD E. CRAVEN | ALEXANDRA CHRONEOU

304 Nosocomial Urinary Tract Infections 3725

THOMAS M. HOOTON

305 Nosocomial Hepatitis and Other Transfusion- and Transplantation-Transmitted Infections 3739

KENT A. SEPKOWITZ | MATTHEW J. KUEHNERT

306 Human Immunodeficiency Virus in Health Care Settings 3753

DAVID K. HENDERSON

307 Nosocomial Herpesvirus Infections 3771

TARA N. PALMORE | DAVID K. HENDERSON

SECTION B

INFECTIONS IN SPECIAL HOSTS

308 Infections in the Immunocompromised Host: General Principles 3781

J. PETER DONNELLY | NICOLE M. A. BLIJLEVENS | BEN E. DE PAUW

309 Prophylaxis and Empirical Therapy of Infection in Cancer Patients 3793

CLAUDIO VISCOLI | ELIO CASTAGNOLA

310 Risk Factors and Approaches to Infections in Transplant Recipients 3809

J. STEPHEN DUMMER | LORA D. THOMAS

311 Infections in Recipients of Hematopoietic Cell Transplantation 3821

JO-ANNE H. YOUNG | DANIEL J. WEISDORF

312 Infections in Solid Organ Transplant Recipients 3839

J. STEPHEN DUMMER | NINA SINGH

313 Infections in Patients with Spinal Cord Injury 3851

RABIH O. DAROUICHE

314 Infections in the Elderly 3857

KENT B. CROSSLEY | PHILLIP K. PETERSON

315 Infections in Asplenic Patients 3865

LARRY I. LUTWICK

316 Infections in Injection Drug Users 3875

DONALD P. LEVINE | PATRICIA D. BROWN

SECTION C

SURGICAL AND TRAUMA-RELATED INFECTIONS

317 Surgical Site Infections and Antimicrobial Prophylaxis 3891

THOMAS R. TALBOT

318 Burns 3905

CLINTON K. MURRAY

319 Bites 3911

ELLIE J. C. GOLDSTEIN

SECTION D

IMMUNIZATION

320 Immunization 3917

WALTER A. ORENSTEIN | LARRY K. PICKERING | ALISON MAWLE |
ALAN R. HINMAN | MELINDA WHARTON

SECTION E

BIODEFENSE

321 Bioterrorism: An Overview 3951

LUCIANA BORIO | NOREEN A. HYNES | DONALD A. HENDERSON

322 Plague as a Bioterrorism Weapon 3965

LUCIANA BORIO | NOREEN A. HYNES

323 *Francisella tularensis* (Tularemia) as an Agent of Bioterrorism 3971

LISA S. HODGES | ROBERT L. PENN

324 Smallpox as an Agent of Bioterrorism 3977

LISA D. ROTZ | JOANNE CONO | INGER K. DAMON

325 Anthrax as an Agent of Bioterrorism 3983

GREGORY J. MARTIN | ARTHUR M. FRIEDLANDER

326 Botulinum Toxin as a Biological Weapon 3993

PAVANI REDDY | THOMAS P. BLECK

327 Viral Hemorrhagic Fevers as Agents of Bioterrorism 3995

C. J. PETERS

SECTION F

ZOONOSES

328 Zoonoses 3999

CAMILLE NELSON KOTTON | ARNOLD N. WEINBERG

SECTION G

PROTECTION OF TRAVELERS

329 Protection of Travelers 4009

DAVID O. FREEDMAN

330 Infections in Returning Travelers 4019

DAVID O. FREEDMAN

Index i