

Table of Contents

1. The Microbial World	1
2. Bacterial Cytology	6
Optical Methods 6	Staining 16
Eucaryotic Cell Structure 6	Morphologic Changes During Growth 20
Procaryotic Cell Structure 10	
3. The Major Groups of Bacteria	22
Principles of Classification 22	Descriptions of the Major Groups of Bacteria 24
4. Microbial Genetics	34
The Physical Basis of Heredity 34	Intercellular Transfer & Genetic Recombination in Bacteria 40
The Procaryotic Chromosome 34	Genes of Structure & Genes of Regulation 46
Mutation 36	Genetics of Drug Resistance 46
5. Microbial Metabolism	51
General Principles of Intermediary Metabolism 51	The Role of Metabolism in Biosynthesis & Growth 59
Catabolic Reactions Involved in Chemosynthesis 53	Specialized Aspects of Microbial Metabolism 62
Storage & Utilization of Energy 57	The Reoxidation of NADH ₂ in Fermentations 70
6. Cultivation of Microorganisms	73
Nutrition 73	Cultivation Methods 75
Environmental Factors Affecting Growth 74	
7. The Growth and Death of Microorganisms	78
Definition & Measurement of Growth 78	Synchronous Growth 80
Exponential Growth 78	Growth Parameters 81
The Growth Curve 79	Definition & Measurement of Death 81
The Maintenance of Cells in Exponential Phase 80	Antimicrobial Agents 83
8. The Microbiology of Special Environments	87
Water 87	Air 91
Milk 88	Soil 93
Foods 90	
9. Bacteriophage	97
Life Cycles of Phage & Host 97	Phage Reproduction 99
Methods of Study 98	Phage Genetics 100
Properties of Phage 98	Lysogeny 102

10. Antimicrobial Chemotherapy		106
Selective Toxicity	106	
Mechanism of Action of Antimicrobial Drugs	106	
Drug Resistance	108	
Drug Dependence	109	
Antimicrobial Activity in Vitro	110	
Antimicrobial Activity in Vivo	110	
Drug-Parasite Relationships	111	
Host-Parasite Relationships	112	
Clinical Use of Antibiotics	112	
Combined Antibiotic Action	113	
Chemoprophylaxis	113	
Antimicrobial Drugs for Local Application	114	
Antimicrobial Drugs for Systemic Administration	114	
11. Host-Parasite Relationships		128
Infection	128	
Attributes of Microorganisms Which Enable Them to Cause Disease	128	
Attributes of the Host Which Determine Resistance to Microorganisms	130	
Some Mechanisms of Nonspecific Host Resistance	130	
Resistance and Immunity	132	
Natural Immunity	132	
Acquired Immunity	133	
12. Antigens & Antibodies		135
Antigens	135	
Antibodies	136	
Structures of Immunoglobulins	137	
Serologic Reactions	141	
Precipitation Reactions	141	
Agglutination Reactions	142	
Toxin-Antitoxin Reactions	143	
Bactericidal & Lytic Reactions	144	
Complement Fixation Reactions	145	
Absorption Reactions	146	
Inhibition Reactions	146	
Immunofluorescence	146	
Other Types of Serologic Reactions	147	
Recommended Immunization of Adults for Travel	147	
13. Allergy & Hypersensitivity		150
Immunologic Tolerance	150	
Immediate Vs Delayed Type of Allergic Reaction	151	
Reactions of the "Immediate" Type	151	
Anaphylaxis	151	
Serum Sickness	153	
Arthus Reaction	154	
"Spontaneous" Clinical Allergy	154	
Reactions of the "Delayed" Type	155	
Tuberculin Hypersensitivity	155	
Other Delayed Type Hypersensitivity Reactions	156	
Allergy to Drugs & Simple Chemicals	157	
Role of Lipids, Waxes, & Adjuvants in the Development of Delayed Hypersensitivity	157	
"Autoimmune," "Autoallergic," or "Hypersensitivity" Diseases	158	
Transplantation Immunity	159	
14. Pyogenic Cocci		161
The Staphylococci	161	
The Streptococci	164	
The Pneumococci	170	
The Neisseriae	172	
15. Gram-Positive Bacilli		176
Aerobic Sporeforming Bacilli	176	
Anthrax	176	
Anaerobic Sporeforming Bacilli	177	
The Clostridia	177	
16. Corynebacteria		182
17. Mycobacteria		186
<i>M Tuberculosis</i>	186	
Other Mycobacteria	191	
<i>M Leprae</i>	192	
18. Enteric Gram-Negative Microorganisms		193
Endotoxins of Gram-Negative Bacteria	193	
The Coliform Bacteria	194	
The Proteus Group	196	
<i>Pseudomonas Aeruginosa</i>	197	
The Salmonellae	197	
The Shigellae	200	
The Vibrios	201	

19. Small Gram-Negative Rods	204
The Brucellae 204	
The Pasteurellae 206	
The Hemophilic Bacteria 209	
	<i>Hemophilus Influenzae</i> 210
	<i>Bordetella (Hemophilus) Pertussis</i> 211
	Other Organisms of the Hemophilus Group 212
20. Miscellaneous Pathogenic Microorganisms	214
Mycoplasmas (PPLo) & L Forms 214	
<i>Streptobacillus Moniliformis</i> 216	
<i>Listeria Monocytogenes</i> 217	
<i>Erysipelothrix Insidiosa (Rhusiopathiae)</i> 217	
Mimeae 217	
	<i>Bartonella Bacilliformis</i> 217
	Bacteroides 218
	<i>Pseudomonas (Actinobacillus) Mallei & Pseudomonas Pseudomallei</i> 218
	<i>Aeromonas Hydrophila</i> 218
21. Spirochetes & Other Spiral Microorganisms	220
<i>Treponema Pallidum</i> 220	
Diseases Related to Syphilis 222	
Other Spirochetal Diseases 223	
<i>Borrelia Recurrentis</i> 223	
Leptospirae 224	
	<i>Spirillum Minus</i> 226
	Spirochetes of the Normal Mouth & Mucous Membranes 226
	Fusospirochetal Disease 226
22. Medical Mycology	227
Structures of Fungi 227	
The Actinomycetes 227	
<i>Actinomyces Israelii</i> 228	
<i>Nocardia Asteroides</i> & Related Species 230	
Superficial Mycoses 231	
Deep Mycoses 234	
<i>Candida Albicans</i> 234	
<i>Cryptococcus Neoformans</i> 235	
<i>Blastomyces Dermatitidis</i> 236	
<i>Blastomyces Brasiliensis</i> 237	
	<i>Histoplasma Capsulatum</i> 238
	<i>Coccidioides Immitis</i> 239
	<i>Geotrichum Candidum</i> 240
	<i>Sporotrichum Schenckii</i> 241
	Chromoblastomycosis 242
	Maduromycosis 242
	Mucormycosis & Aspergillosis 243
	Hypersensitivity to Fungi 243
	Mycotoxins 243
23. Normal Microbial Flora of the Human Body	244
Role of the Resident Flora 244	
Normal Flora of the Skin 244	
Normal Flora of the Mouth & Upper Respiratory Tract 245	
	Normal Flora of the Intestinal Tract 245
	Normal Flora of the Vagina 246
	Normal Flora of the Eye (Conjunctiva) 246
24. Principles of Diagnostic Medical Microbiology	247
Communication Between Physician & Laboratory 247	
Specimens 247	
Selection of Laboratory Investigations 248	
The Demonstration of an Infectious Agent 248	
Serologic Tests & The Demonstration of Specific Antibody 254	
	Skin Tests 256
	Nonspecific Clinical Laboratory Tests 258
	Laboratory Aids in the Selection of Antimicrobial Therapy 259
	Gram & Acid-Fast Staining Methods 262
25. Rickettsial Diseases	263
26. Agents of Psittacosis-LGV-Trachoma Group (Bedsoniae, Chlamydiae)	268
Psittacosis 270	
Lymphogranuloma Venereum 272	
	Trachoma & Inclusion Conjunctivitis 273
	Other Agents of the Group 275
27. General Properties of Viruses	276
Classification 276	
General Properties 279	
Evolution of Viruses 279	
Biophysical Properties of Viruses 280	
Measuring the Sizes of Viruses 284	
Purification of Virus Particles 285	
	Identification of a Particle as a Virus 285
	Reaction to Physical & Chemical Agents 286
	Cultivation of Viruses 287
	Virus Hemagglutination 287
	Replication of Viruses 288
	In Vitro Synthesis of Infectious Viral DNA 290

27. General Properties of Viruses (cont'd)	
Viral Genetics & Viral Interactions 291	Chromosome Damage 301
Experimental Chemoprophylaxis of Virus Infections 295	Latent Virus Infections 301
Interference Phenomenon & Interferon 297	Natural History (Ecology) & Modes of Transmission of Viruses & Rickettsiae 303
Pathogenesis of Virus Diseases 298	Simultaneous Administration of Virus Vaccines 303
Inclusion Body Formation 300	
28. Isolation of Viruses From Clinical Specimens 310	
Considerations in the Diagnosis of Viral Diseases 310	Preparation of Inocula 314
Direct Examination of Clinical Material 311	Animal Inoculation 314
Virus Isolation Technic 311	Cultivation in Tissue Culture 314
Specimens for Study 313	Chick Embryo Technic 315
Preservation of Viruses 313	Examination of Embryos 316
29. Serologic Diagnosis of Virus Infections 317	
Neutralization Tests 317	Mixed Hemadsorption Test 323
Quantitative Neutralization Tests 318	Precipitation Reactions 323
The Neutralization Test in Tissue Culture 319	Microflocculation Test 324
Neutralization Tests in Eggs 310	Immunofluorescence Test 324
Complement Fixation Tests 320	Diagnosis of Infectious Mononucleosis 324
Soluble & Viral Antigens 321	Heterophil Agglutination Test 324
Epidemiologic Interpretation 321	Adsorption Test for Increased Specificity 325
Hemagglutination Inhibition Tests 321	Tests for Dermal Hypersensitivity 325
Standards & Titration 322	
The Diagnostic Agglutination Inhibition Test 322	
30. Arthropod-Borne (Arbo) Viral Diseases 330	
Arbovirus Encephalitides 331	Hemorrhagic Fever 342
California Encephalitis 336	Sandfly Fever 342
West Nile Fever 337	Colorado Tick Fever 343
Yellow Fever 338	Rift Valley Fever 344
Dengue 340	Lassa Fever 344
31. Picornavirus Group (Enterovirus & Rhinovirus Subgroups) 345	
Poliomyelitis 345	Rhinovirus Group 354
Coxsackievirus Group 350	Foot-and-Mouth Disease 356
Echovirus Group 352	
32. Hepatitis Viruses 357	
33. Rabies & Certain Other Viral Diseases of the Nervous System; Slow Viruses 362	
Rabies 362	Epidemic Neuromyasthenia 367
Aseptic Meningitis 366	Mengo Fever 368
Lymphocytic Choriomeningitis 367	Chronic Viral Diseases of the CNS & Other Progressive Degenerative Disorders 368
Encephalitis Lethargica 367	
34. Myxovirus Group (Influenza) 370	

35. Paramyxovirus Group & Rubella Virus		377
Mumps	377	
Measles	379	
Parainfluenza Virus Infections	382	
Respiratory Syncytial (RS) Virus	383	
	Newcastle Disease Conjunctivitis	384
	German Measles	384
	Postnatal Rubella	385
	Congenital Rubella Syndrome	385
36. Poxvirus Group		388
Smallpox & Related Viral Infections of Man	388	
Variola Major, Variola Minor, Vaccinia	388	
Cowpox	397	
	Yaba Monkey Virus	397
	Molluscum Contagiosum	398
37. Adenovirus Group		399
38. Herpesvirus Group		405
Herpes Simplex	405	
Varicella-Zoster Virus	408	
Cytomegalovirus	410	
EB Herpesvirus	412	
	Infectious Mononucleosis	413
	B Virus	414
	Marmoset Herpesvirus	414
39. Diplornavirus (Reovirus), Coronavirus, & Other Viral Infections of Man		416
Diplornavirus Group	416	
Reoviruses	416	
Colorado Tick Fever Virus	417	
Coronavirus Group	418	
	Warts	418
	Exanthem Subitum	419
	Epidemic Viral Gastroenteritis	419
	Cat Scratch Fever	420
40. Oncogenic Viruses		421
	<i>Matilda Benyesh-Melnick</i>	
RNA-Containing Tumor Viruses	423	
DNA-Containing Tumor Viruses	431	
	Viruses & Human Cancer	437
Appendix: Medical Parasitology		441
	<i>J. Ralph Audy & Frederick L. Dunn</i>	
Classification	441	
<i>Giardia Lamblia</i>	442	
Trichomonas	442	
Other Intestinal Flagellates	443	
The Hemoflagellates	444	
Leishmania	444	
Trypanosoma	445	
<i>Entamoeba Histolytica</i>	448	
Other Intestinal Amebas	449	
	The Plasmodia	451
	The Isospora	454
	<i>Sarcocystis Lindemanni</i>	454
	<i>Toxoplasma Gondii</i>	455
	<i>Pneumocystis Carinii</i>	458
	<i>Balantidium Coli</i>	458
	Helminths: Ova in Feces & Microfilariae in Blood	
	& Tissues	459
	Illustrations	460
Index		471