

CONTENTS

Editor-in-Chief	v
Associate Editors	vii
Preface	ix
Contributors	xi

SECTION I: GENERAL TOPICS

History of Virology: Bacteriophages	<i>H-W Ackermann</i>	3
History of Virology: Plant Viruses	<i>R Hull</i>	10
History of Virology: Vertebrate Viruses	<i>F Fenner</i>	15
Nature of Viruses	<i>M H V van Regenmortel</i>	19
Origin of Viruses	<i>P Forterre</i>	23
Ribozymes	<i>E Westhof and A Lescoute</i>	30
Virus Species	<i>M H V van Regenmortel</i>	37
Quasispecies	<i>R Sanjuán</i>	42
Virus Databases	<i>E J Lefkowitz, M R Odom and C Upton</i>	49
Phylogeny of Viruses	<i>A E Gorbalenya</i>	66
Evolution of Viruses	<i>L P Villarreal</i>	70
Taxonomy, Classification and Nomenclature of Viruses	<i>C M Fauquet</i>	80
Virus Classification by Pairwise Sequence Comparison (PASC)	<i>Y Bao, Y Kapustin and T Tatusova</i>	95
Prions of Vertebrates	<i>J D F Wadsworth and J Collinge</i>	101
Viruses and Bioterrorism	<i>R F Meyer and S A Morse</i>	107

SECTION II: VIRIONS

Principles of Virion Structure	<i>J E Johnson and J A Speir</i>	115
Structure of Non-Enveloped Virions	<i>J A Speir and J E Johnson</i>	123
Electron Microscopy of Viruses	<i>G Schoehn and R W H Ruigrok</i>	136
Cryo-Electron Microscopy	<i>W Chiu, J T Chang and F J Rixon</i>	145
Assembly of Non-Enveloped Virions	<i>M Luo</i>	156
Assembly of Enveloped Virions	<i>C K Navaratnarajah, R Warrier and R J Kuhn</i>	160

Assembly of Bacterial Viruses	<i>S Casjens</i>	167
Genome Packaging in Bacterial Viruses	<i>P Jardine</i>	175
Viral Membranes	<i>J Lenard</i>	181
<i>Mimivirus</i>	<i>J-M Claverie</i>	188

SECTION III: NUCLEIC ACIDS

Recombination	<i>J J Bujarski</i>	199
Satellite Nucleic Acids and Viruses	<i>P Palukaitis, A Rezaian and F García-Arenal</i>	207
Retrotransposons of Vertebrates	<i>A E Peaston</i>	217
Defective-Interfering Viruses	<i>L Roux</i>	226
Interfering RNAs	<i>K E Olson, K M Keene and C D Blair</i>	230
Viruses as Vectors in Gene Therapy	<i>K I Berns and T R Flotte</i>	236

SECTION IV: VIRUS INFECTION

Viral Receptors	<i>D J Evans</i>	245
Virus Entry to Bacterial Cells	<i>M M Poranen and A Domanska</i>	250
Membrane Fusion	<i>A Hinz and W Weissenhorn</i>	256
Replication of Viruses	<i>A J Cann</i>	265
Persistent and Latent Viral Infection	<i>E S Mocarski and A Grakoui</i>	271
Apoptosis and Virus Infection	<i>J R Clayton and J M Hardwick</i>	279
Viral Pathogenesis	<i>N Nathanson</i>	287
Antiviral Agents	<i>H J Field and R A Vere Hodge</i>	292
Diagnosis Using Serological and Molecular Approaches	<i>R Vainionpää and P Leinikki</i>	304
Diagnosis Using Microarrays	<i>K Fischer, A Urisman and J DeRisi</i>	311
Disease Surveillance	<i>N Noah</i>	315

SECTION V: IMMUNE RESPONSES

Innate Immunity	<i>F Weber</i>	325
Defeating Innate Immunity	<i>C F Basler</i>	331
Antigen Presentation	<i>E I Zuniga, D B McGavern and M B A Oldstone</i>	338
Antigenicity and Immunogenicity of Viral Proteins	<i>M H V van Regenmortel</i>	343
Cytokines and Chemokines	<i>D E Griffin</i>	349
Cell-Mediated Immunity to Viruses	<i>A J Zajac and L E Harrington</i>	354
Antibody-Mediated Immunity to Viruses	<i>A R Neurath</i>	361
Orthomyxovirus Antigen Structure	<i>R J Russell</i>	376
Vaccine Strategies	<i>I Kusters and J W Almond</i>	381
DNA Vaccines	<i>S Babiuk and L A Babiuk</i>	390

Vaccine Safety	<i>C J Clements and G Lawrence</i>	394
Neutralization of Infectivity	<i>P J Klasse</i>	404
Immunopathology	<i>M B A Oldstone and R S Fujinami</i>	410
SECTION VI: DESCRIPTION AND MOLECULAR BIOLOGY OF SOME VIRUSES		
Adenoviruses: Molecular Biology	<i>K N Leppard</i>	419
Baculoviruses: Molecular Biology of Granuloviruses	<i>S Hilton</i>	426
Baculoviruses: Molecular Biology of Nucleopolyhedroviruses	<i>D A Theilmann and G W Blissard</i>	434
Coronaviruses: Molecular Biology	<i>S C Baker</i>	445
Hepatitis B Virus: Molecular Biology	<i>T J Harrison</i>	453
Herpes Simplex Viruses: Molecular Biology	<i>E K Wagner and R M Sandri-Goldin</i>	460
Human Cytomegalovirus: Molecular Biology	<i>W Gibson</i>	469
Human Immunodeficiency Viruses: Molecular Biology	<i>J Votteler and U Schubert</i>	474
Iridoviruses	<i>V G Chinchur and A D Hyatt</i>	481
Kaposi's Sarcoma-Associated Herpesvirus: Molecular Biology	<i>E Gellermann and T F Schulz</i>	488
Mononegavirales	<i>A J Easton and R Ling</i>	495
Nidovirales	<i>L Enjuanes, A E Gorbalenya, R J de Groot, J A Cowley, J Ziebuhr and E J Snijder</i>	505
Nodaviruses	<i>P A Venter and A Schneemann</i>	516
Orthomyxoviruses: Molecular Biology	<i>M L Shaw and P Palese</i>	524
Antigenic Variation	<i>G M Air and J T West</i>	530
Papillomaviruses: Molecular Biology of Human Viruses	<i>P F Lambert and A Collins</i>	540
Partitiviruses	<i>S A Ghabrial, W F Ochoa, T S Baker and M L Nibert</i>	548
Phycodnaviruses	<i>J L van Etten and M V Graves</i>	556
Picornaviruses: Molecular Biology	<i>B L Semler and K J Ertel</i>	565
Reoviruses: Molecular Biology	<i>K M Coombs</i>	577
Seadornaviruses	<i>H Attoui and P P C Mertens</i>	586
Tetraviruses	<i>J A Speir and J E Johnson</i>	597
Togaviruses: Molecular Biology	<i>K D Ryman, W B Klimstra and S C Weaver</i>	606
Index		615