Contents

Preface .............................................................................................................. v
Contributors ..................................................................................................... xi

PART I. VIRAL DETECTION

1 Viral Detection
   Feng Wang-Johanning and Gary L. Johanning ........................................ 3

2 Quantitative Detection of Epstein-Barr Virus DNA
   in Clinical Specimens by Rapid Real-Time PCR
   Targeting a Highly Conserved Region of EBNA-1
   Servi J. C. Stevens, Sandra A. W. M. Verkuijlen,
   and Jaap M. Middeldorp ................................................................. 15

3 Profiling of Epstein-Barr Virus Latent RNA Expression
   in Clinical Specimens by Gene-Specific Multiprimed cDNA
   Synthesis and PCR
   Servi J. C. Stevens, Antoinette A. T. P. Brink,
   and Jaap M. Middeldorp ............................................................... 27

4 Quantitative Detection of Viral Gene Expression in Populations
   of Epstein-Barr Virus-Infected Cells In Vivo
   Donna R. Hochberg and David A. Thorley-Lawson ........................... 39

5 Detection and Quantification of the Rare Latently Infected Cell
   Undergoing Herpes Simplex Virus Transcriptional Activation
   in the Nervous System In Vivo
   Nancy M. Sawtell ................................................................................ 57

6 Reporter Cell Lines for the Detection of Herpes Simplex Viruses
   Szu-Hao Kung ..................................................................................... 73

PART II. VIRUS STRUCTURE AND IMAGING

7 Unraveling the Architecture of Viruses
   by High-Resolution Atomic Force Microscopy
   Alexander J. Malkin, Marco Plomp, and Alexander McPherson ...... 85

8 Studying the Structure of Large Viruses With Multiresolution Imaging
   Carmen San Martin ................................................................. 109

9 Herpes Simplex Virus–Cell Interactions Studied by Low-Fading
   Contrasted Immunofluorescence
   Helle Lone Jensen and Bodil Norrild ................................................ 129
Contents

10 Herpes Simplex Virus–Cell Interactions Studied by Immunogold Cryosection Electron Microscopy
Helle Lone Jensen and Bodil Norrild ................................................ 143

11 FTIR Microscopy Detection of Cells Infected With Viruses
Vitaly Erukhimovitch, Marina Talyshinsky, Yelena Souprun, and Mahmoud Huleihel ................................................................. 161

PART III. VIRUS ENTRY
12 The JC Virus-Like Particle Overlay Assay
Hirofumi Sawa and Rika Komagome ................................................ 175

13 Analysis of Fusion Using a Virus-Free Cell Fusion Assay
Marisa P. McShane and Richard Longnecker ................................... 187

14 Pseudovirions as Specific Tools for Investigation of Virus Interactions With Cells
Martin Sapp and Hans-Christoph Selinka ......................................... 197

PART IV. GENE EXPRESSION
15 Simultaneous In Situ Detection of RNA, DNA, and Protein Using Tyramide-Coupled Immunofluorescence
Brian A. Van Tine, Thomas R. Broker, and Louise T. Chow ............. 215

16 Identification and Characterization of Herpesviral Immediate-Early Genes
Yan Yuan ........................................................................................... 231

PART V. REPLICATION AND GENOME MAINTENANCE
17 Methods for Measuring the Replication and Segregation of Epstein-Barr Virus-Based Plasmids
Priya Kapoor and Lori Frappier ........................................................ 247

18 DNA Affinity Purification of Epstein-Barr Virus OriP-Binding Proteins
Constandache Atanasiu, Larissa Lezina, and Paul M. Lieberman .... 267

PART VI. PATHOGENESIS
19 Pre-B-Cell Colony Formation Assay
Masato Ikeda and Richard Longnecker ............................................ 279

20 Luciferase Real-Time Bioluminescence Imaging for the Study of Viral Pathogenesis
Gary D. Luker and David A. Leib ..................................................... 285

PART VII. COMPLEX CELL SYSTEMS
21 Culturing Primary and Transformed Neuronal Cells for Studying Pseudorabies Virus Infection
Toh Hean Ch’ng, E. Alexander Flood, and Lynn William Enquist ...... 299
Contents ix

22 Human Papillomavirus Type 31 Life Cycle:
Methods for Study Using Tissue Culture Models
Frauke Fehrmann and Laimonis A. Laimins ................................. 317

PART VIII. RECOMBINANT GENETICS
23 Molecular Genetics of Herpesviruses:
A Recombinant Technology Approach
Jason S. Knight, Subhash C. Verma, Ke Lan, and Erle S. Robertson ... 333
24 Molecular Genetics of DNA Viruses:
Recombinant Virus Technology
Bernhard Neuhierl and Henri-Jacques Delecluse ............................ 353
25 Genetic Analysis of Cytomegalovirus by Shuttle Mutagenesis
Manfred Lee and Fenyoung Liu ..................................................... 371
26 Construction of a Gene Inactivation Library for Bovine
herpesvirus 1 Using Infectious Clone Technology
Timothy J. Mahony, Fiona M. McCarthy, Jennifer L. Gravel, and Peter L. Young ................................................................. 387
27 Selective Silencing of Viral Gene E6 and E7 Expression
in HPV-Positive Human Cervical Carcinoma Cells
Using Small Interfering RNAs
Ming Jiang and Jo Milner ............................................................. 401

PART IX. COMPUTATION/SYSTEMS BIOLOGY OF VIRUSES
28 Design of a Herpes Simplex Virus Type 2 Long
Oligonucleotide-Based Microarray: Global Analysis of HSV-2
Transcript Abundance During Productive Infection
J. S. Aguilar, Peter Ghazal, and Edward K. Wagner ....................... 423
29 Real-Time Quantitative PCR Analysis of Viral Transcription
James Papin, Wolfgang Vahrson, Rebecca Hines-Boykin, and Dirk P. Dittmer ................................................................. 449
30 Rapid Screening of Chemical Inhibitors That Block
Processive DNA Synthesis of Herpesviruses:
Potential Application to High-Throughput Screening
Robert P. Ricciardi, Kai Lin, Xulin Chen, Dorjbal Dorjsuren,
Robert Shoemaker, and Shizuko Sei ........................................... 481
Index .............................................................................................. 493
DNA Viruses
Methods and Protocols
Lieberman, P.M. (Ed.)
2005, XIV, 498 p., Hardcover
ISBN: 978-1-58829-353-4
A product of Humana Press