
Contents

<i>Preface</i>	<i>v</i>
<i>Contributors</i>	<i>ix</i>
1 Coronaviruses: An Overview of Their Replication and Pathogenesis <i>Anthony R. Febr and Stanley Perlman</i>	1
PART I DETECTION, DIAGNOSIS AND EVOLUTION OF CORONAVIRUSES	
2 Identification of a Novel Coronavirus from Guinea Fowl Using Metagenomics <i>Mariette F. Ducatez and Jean-Luc Guérin</i>	27
3 Serological Diagnosis of Feline Coronavirus Infection by Immunochromatographic Test <i>Tomomi Takano and Tsutomu Hobdatsu</i>	33
4 Estimation of Evolutionary Dynamics and Selection Pressure in Coronaviruses <i>Muhammad Munir and Martí Cortey</i>	41
PART II PROPOGATION, TITRATION, AND PURIFICATION OF CORONAVIRUSES	
5 The Preparation of Chicken Tracheal Organ Cultures for Virus Isolation, Propagation, and Titration <i>Ruth M. Hennion</i>	51
6 The Preparation of Chicken Kidney Cell Cultures for Virus Propagation <i>Ruth M. Hennion and Gillian Hill</i>	57
7 Isolation and Propagation of Coronaviruses in Embryonated Eggs <i>James S. Guy</i>	63
8 Characterization of Human Coronaviruses on Well-Differentiated Human Airway Epithelial Cell Cultures <i>Hulda R. Jonsdottir and Ronald Dijkman</i>	73
9 Quantification of Infectious Bronchitis Coronavirus by Titration In Vitro and In Ovo <i>Joeri Kint, Helena Jane Maier, and Erik Jagt</i>	89
10 Purification of Coronavirus Virions for Cryo-EM and Proteomic Analysis <i>Stuart Dent and Benjamin W. Neuman</i>	99
11 Partial Purification of IBV and Subsequent Isolation of Viral RNA for Next-Generation Sequencing <i>Sarah M. Keep, Erica Bickerton, and Paul Britton</i>	109

PART III MANIPULATING THE GENOMES OF CORONAVIRUSES

- 12 Transient Dominant Selection for the Modification and Generation of Recombinant Infectious Bronchitis Coronaviruses. 115
Sarah M. Keep, Erica Bickerton, and Paul Britton
- 13 Engineering Infectious cDNAs of Coronavirus as Bacterial Artificial Chromosomes. 135
Fernando Almazán, Silvia Márquez-Jurado, Aitor Nogales, and Luis Enjuanes

PART IV CORONAVIRUS ATTACHMENT AND ENTRY

- 14 Protein Histochemistry Using Coronaviral Spike Proteins: Studying Binding Profiles and Sialic Acid Requirements for Attachment to Tissues. 155
Iresha N. Ambepitiya Wickramasinghe and M. Hélène Verbeije
- 15 Identification of Protein Receptors for Coronaviruses by Mass Spectrometry. 165
V. Stalin Raj, Mart M. Lamers, Saskia L. Smits, Jeroen A.A. Demmers, Huibhui Mou, Berend-Jan Bosch, and Bart L. Haagmans
- 16 Single Particle Tracking Assay to Study Coronavirus Membrane Fusion. 183
Deirdre A. Costello and Susan Daniel

PART V STUDYING VIRUS-HOST INTERACTIONS

- 17 Studying Coronavirus–Host Protein Interactions. 197
Chee-Hing Yang, Hui-Chun Li, Cheng-Huei Hung, and Shih-Yen Lo
- 18 A Field-Proven Yeast Two-Hybrid Protocol Used to Identify Coronavirus–Host Protein–Protein Interactions 213
Pierre-Olivier Vidalain, Yves Jacob, Marne C. Hagemeijer, Louis M. Jones, Grégory Neveu, Jean-Pierre Roussarie, Peter J.M. Rottier, Frédéric Tangy, and Cornelis A.M. de Haan
- 19 Investigation of the Functional Roles of Host Cell Proteins Involved in Coronavirus Infection Using Highly Specific and Scalable RNA Interference (RNAi) Approach 231
Jean Kaoru Millet and Béatrice Nal
- 20 Transcriptome Analysis of Feline Infectious Peritonitis Virus Infection. 241
Parvaneh Mehrbod, Mohammad Syamsul Reza Harun, Ahmad Naqib Shuid, and Abdul Rahman Omar
- 21 Quantification of Interferon Signaling in Avian Cells. 251
Joeri Kint and Maria Forlenza
- 22 Studying the Dynamics of Coronavirus Replicative Structures 261
Marne C. Hagemeijer and Cornelis A.M. de Haan
- 23 Preparation of Cultured Cells Using High-Pressure Freezing and Freeze Substitution for Subsequent 2D or 3D Visualization in the Transmission Electron Microscope 271
Philippa C. Hawes

- Index* 283

Coronaviruses

Methods and Protocols

Maier, H.J.; Bickerton, E.; Britton, P. (Eds.)

2015, XI, 285 p. 42 illus., 27 illus. in color., Hardcover

ISBN: 978-1-4939-2437-0

A product of Humana Press