

Table of contents

List of contributors, ix

Foreword to the second edition, xiv

Preface to the second edition, xvi

Acknowledgments, xvii

PART 1 Influenza: Perspective

1 Human influenza: One health, one world, 3

Daniel B. Jernigan and Nancy J. Cox

2 Influenza pandemics: History and lessons learned, 20

Arnold S. Monto and Robert G. Webster

PART 2 Structure and replication

3 Structure, disassembly, assembly, and budding of influenza viruses, 37

Debiprosad Nayak, Sakar Shivakoti, Rilwan A. Balogun, Gwendolyn Lee, and Z. Hong Zhou

4 The virus genome and its replication, 57

Robert M. Krug and Ervin Fodor

5 Influenza glycoproteins: Hemagglutinin and neuraminidase, 67

Rupert J. Russell, Steven J. Gamblin, and John J. Skehel

6 Proton channels of influenza A and B viruses, 101

Chunlong Ma, Lawrence H. Pinto, and Robert A. Lamb

7 The NS1 protein: A master regulator of host and viral functions, 114

Robert M. Krug and Adolfo García-Sastre

8 Structure and function of the influenza virus replication machinery and PB1-F2, 133

Andrew Mehle and Jonathan A McCullers

9 The genome and its manipulation: Recovery of the 1918 virus and vaccine virus generation, 146

Gabriele Neumann and Yoshihiro Kawaoka

10 Pathogenesis, 157

Hans Dieter Klenk, Wolfgang Garten, and Mikhail Matrosovich

PART 3 Evolution and ecology of influenza viruses

11 Ecology and evolution of influenza viruses in wild and domestic birds, 175

Ron A.M. Fouchier and Yi Guan

12 Influenza in swine, 190

Richard Webby and Juergen Richt

13 Equine/Canine/Feline/Seal influenza, 203

Thomas M. Chambers, Edward J. Dubovi, and Ruben O. Donis

14 Emergence and Evolution of the 1918, 1957, 1968, and 2009 pandemic virus strains, 218

Taia T. Wang and Peter Palese

PART 4 Epidemiology and surveillance

15 Influenza surveillance and laboratory diagnosis, 231

Maria Zambon

16 Epidemiology of influenza, 250

Marc-Alain Widdowson and Arnold S. Monto

PART 5 Immunology of influenza

17 Innate immunity, 269

Akiko Iwasaki and Malik Peiris

18 Antibody-mediated immunity, 283

Nicole Baumgarth, Michael C. Carroll, and Santiago Gonzalez

19 Cell-mediated immunity, 298

Stephen J. Turner, Peter C. Doherty, and Anne Kelso

PART 6 Vaccines and vaccine development

20 Immunogenicity, efficacy of inactivated/live virus seasonal and pandemic vaccines, 313

Wendy A. Keitel, Kathleen M. Neuzil, and John Treanor

21 New approaches to vaccination, 327

Chih-Jen Wei, Damian C. Ekiert, Gary J. Nabel, and Ian A. Wilson

22 Control of influenza in animals, 337

Ilaria Capua and Dennis J. Alexander

23 Influenza vaccine production, 352

Klaus Stöhr

PART 7 Clinical aspects and antivirals

24 Human influenza: Pathogenesis, clinical features, and management, 373

Frederick G. Hayden and Menno D. de Jong

25 Antivirals: Targets and use, 392

Michael G. Ison and Alan Hay

26 The control of influenza and cost-effectiveness of interventions, 419
Carolyn B. Bridges, Samuel K. Peasah, and Martin I. Meltzer

27 Applications of quantitative modeling to influenza virus transmission dynamics, antigenic and genetic evolution, and molecular structure, 434
Marc Lipsitch and Derek Smith

28 Pandemic preparedness and response, 453
Jonathan S. Nguyen-Van-Tam and Joseph Bresee

29 Influenza: The future, 470
Thomas J. Braciale

PART 8 The outbreak of H7N9

30 Appendix, 479
Thomas J. Braciale