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Titolo	Textbook of influenza // edited by Robert G. Webster ... [et al.]
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Edizione	[2nd ed.]
Descrizione fisica	1 online resource (522 p.)
Altri autori (Persone)	WebsterRobert G. <1932->
Disciplina	616.2/03
Soggetti	Influenza
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	PART 1: Influenza: Perspective -- 1: Human influenza: One health, one world -- Introduction -- Global impact of influenza -- Influenza in a crowded, connected, and converging world -- Increasingly crowded -- Increasingly connected -- Convergence: poultry, pigs, people, and pandemics -- Global interconnectedness requires global coordination and response -- Global challenges for surveillance -- Global regulations for detection and control -- Global network for surveillance -- New opportunities in a changing world -- New tools for global detection and surveillance -- Instant and converging information -- Conclusions -- Acknowledgments -- References -- 2: Influenza pandemics: History and lessons learned -- Introduction -- Past and recent influenza pandemics -- The 1889 and 1918 pandemics -- The 1957 and 1968 pandemics -- Events in 1976 and 1977 -- The threat of an A (H5N1) pandemic -- Response to the H5N1 threat -- The 2009 H1N1 influenza pandemic -- Lessons learned from past influenza pandemics -- Zoonotic origins and unpredictability of pandemics -- Surveillance in swine was inadequate -- Antigenic and structural similarities are not predictors of severity -- An influenza pandemic can arise anywhere in the world -- Pandemic influenza can emerge in any season -- Initial retention of avian receptor binding characteristics in pandemic influenza viruses -- Vaccines to pandemic influenza viruses

are not available during the first wave of infection -- Antivirals are the first line of defense -- Conclusions -- Acknowledgments -- References -- PART 2: Structure and replication -- 3: Structure, disassembly, assembly, and budding of influenza viruses -- Introduction -- Structure and virus morphology -- Structure. Virus morphology -- Disassembly -- Fusion process -- Release of viral RNP -- Transport and assembly -- Budding -- Role of viral proteins -- Role of the eight RNP segments -- Role of host components -- Bud initiation -- Bud elongation and closure -- Conclusions -- Acknowledgments -- References -- 4: The virus genome and its replication -- The segmented RNA virus genome of influenza A and B viruses -- Viral mRNA synthesis (transcription) and viral RNA replication -- Regulation of viral RNA synthesis in infected cells -- The role of host factors in viral RNA synthesis -- Splicing and nuclear export of viral mRNAs -- Nuclear export of viral RNPs -- References -- 5: Influenza glycoproteins: Hemagglutinin and neuraminidase -- HA and NA structures, functions, antigenicity and classification: An overview -- Functions of hemagglutinin -- Receptor binding -- Receptor binding summary -- Hemagglutinin-mediated membrane fusion -- Membrane fusion summary -- Neuraminidase -- Inhibitors of HA and NA functions and potential antiviral drugs -- Receptor binding -- Membrane fusion -- Anti-NA drugs -- Prospects for additional targets for inhibition -- Antigenicity of HA and NA -- Structures of complexes formed by HA and NA with antibodies -- Infectivity neutralization -- Variation of HA and NA -- Effects of HA and NA glycosylation -- Cross-reactive anti-HA antibodies -- HA/NA co-variation of activity and specificity -- References -- 6: Proton channels of influenza A and B viruses -- Influenza A virus M2 protein -- The A/M2 protein has ion channel activity that is required for efficient viral replication -- M2 proton conduction mechanism -- Atomic structures of the A/M2 channel -- Inhibition of the A/M2 channel -- New development of A/M2 channel inhibitors -- Influenza B virus BM2 protein is also a proton channel

7: The NS1 protein: A master regulator of host and viral functions -- Introduction -- General features and structures of the influenza A virus NS1 protein -- Molecular and cellular functions -- Inhibition of the RIG-I pathway -- Inhibition of host gene expression -- Inhibition of the activity of two antiviral proteins: PKR and 2-5-oligoadenylate synthetase (OAS) -- Induction of the PI3 K by the NS1 protein -- Roles of the C-terminal motifs of the NS1 protein -- Other NS1 functions -- Unique function of the NS1 protein of influenza B virus (B/NS1): Binding IFN-induced ISG15 -- Regulation of the function of the NS1 protein of influenza A virus -- Impact of the NS1 protein of influenza A virus in virulence, host tropism, and immune responses -- NS1 protein as an antiviral target -- NS1-modified viruses as potential live attenuated vaccines -- Conclusions -- References -- 8: Structure and function of the influenza virus replication machinery and PB1-F2 -- Architecture of the vRNP -- Atomic structure of the influenza polymerase -- PA -- PB2 -- Role of PB1-F2 -- Composition and structure -- Functions -- Evolution and adaptation -- Perspectives -- Note added in proof -- Acknowledgments -- References -- 9: The genome and its manipulation: Recovery of the 1918 virus and vaccine virus generation -- The pandemic 1918 virus - an elusive killer virus is identified -- Virulence and pathogenicity of pandemic 1918 virus infections -- Host responses to infection with pandemic 1918 virus -- Bacterial coinfections in pandemic 1918 virus infections -- Viral determinants of pandemic 1918 virus pathogenicity -- Hemagglutinin (HA) -- Replication complex -- NS1 -- PB1-F2 -- NA -- Generation of vaccine

viruses -- References -- 10: Pathogenesis -- Introduction -- Disease in mammalian and avian hosts -- Mammalian influenza -- Avian influenza.

Avian influenza virus infections in mammalian host -- Pathogenic mechanisms -- Tropism -- Spread of infection -- Virus load -- Escape of host defense -- Modulation of inflammatory response -- Synergism between influenza viruses and bacteria -- Hemagglutinin determines tropism and spread of infection -- Receptor specificity -- Fusion activation -- Pathogenicity is a multifactorial trait: receptor specificity, N-glycosylation and fusion activity of HA determine lung pathogenicity in mice -- Neuraminidase promotes virus release and destroys decoy receptors -- Polymerase determines replication rates -- NS1 modulates host responses -- Modulation of the IFN response -- Modulation of signaling cascades -- Modulation of apoptosis -- PB1-F2 and PA-X - other modulators of host responses -- Acknowledgments --

References -- PART 3: Evolution and ecology of influenza viruses -- 11: Ecology and evolution of influenza viruses in wild and domestic birds -- Introduction -- Recognition of the influenza ecosystem -- Aquatic birds as the natural reservoir of influenza A viruses -- Interspecies transmission of avian influenza viruses -- Natural reservoirs -- Recognition of influenza viruses in wild birds worldwide -- Wild birds: anseriformes -- Wild birds: charadriiformes -- Wild birds: other species -- Perpetuation, replication, and transmission in the wild bird populations -- Influenza in domestic birds -- Recognition of influenza viruses in domestic birds worldwide -- Interaction between wild and domestic birds -- Terrestrial poultry -- Prevalence and perpetuation in poultry -- Maintenance in domestic ducks and geese -- Establishment and development in terrestrial poultry -- Genesis and development of highly pathogenic H5 and H7 influenza viruses -- HPAI H5N1 virus -- H5N1 outbreaks in domestic birds -- H5N1 in wild birds -- H5N1 in mammals.

Interspecies transmission -- Interspecies transmission from aquatic birds to terrestrial poultry -- Interspecies transmission to humans and other mammals -- Evolution of influenza A virus in different hosts -- Evolution of influenza viruses in aquatic birds and the formation of Eurasian and American influenza gene pools -- Reassortment -- Evolution of influenza viruses in domestic birds -- Evolution of the HPAI H5N1 virus -- Conclusions and outlook -- References -- 12: Influenza in swine -- Influenza as a swine disease -- Molecular epidemiology of swine influenza viruses -- Molecular epidemiology in North America -- Molecular epidemiology in Europe -- Molecular epidemiology in South-East Asia -- Cross-species transmission of swine influenza viruses -- Swine as intermediate hosts -- Challenges to the control of swine influenza -- Challenges in swine influenza surveillance -- Knowledge gaps -- Acknowledgments -- References -- 13: Equine/Canine/Feline/Seal influenza -- Equine influenza -- History -- Pathology -- Virus characterization -- Vaccines -- Experimental challenge models -- Infectivity of EIV for humans -- Canine influenza -- Equine origin CIV (H3N8) -- Avian origin influenza A virus H3N2 -- Avian origin influenza A virus H5N1 -- A/H1N1pdm09 virus -- Other -- Feline influenza -- Influenza in marine mammals --

Acknowledgments -- References -- 14: Emergence and evolution of the 1918, 1957, 1968, and 2009 pandemic virus strains -- Definition of pandemic influenza disease -- Background -- Determinants of evolution and emergence of pandemic influenza virus strains -- Evolution resulting from gene segment reassortment -- Evolution resulting from fixation of genomic mutations -- Emergence of novel virus strains -- Extinction of seasonal strains -- The 1918, 1957,

1968, and 2009 influenza virus pandemics -- The H1N1 "Spanish" influenza pandemic of 1918 -- The H2N2 "Asian" pandemic virus of 1957.

pt. 1. Influenza : perspective -- pt. 2. Structure and replication -- pt. 3. Evolution and ecology of influenza viruses -- pt. 4. Epidemiology and surveillance -- pt. 5. Immunology of influenza -- pt. 6. Vaccines and vaccine development -- pt. 7. Clinical aspects and antivirals -- pt. 8. The outbreak of H7N9.

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## Sommario/riassunto

The Textbook of Influenza is a comprehensive resource covering all aspects of influenza, from the genetic and molecular biology of the virus through to clinical aspects of the disease and the latest drug developments and treatments. This new edition has been completely revised and reflects the integration of disciplines concerning the emergence, evolution, pathogenesis and control of influenza viruses in the field of human and veterinary public health. Textbook of Influenza examines the lessons learnt from the latest pandemic and provides the current state of knowledge for many yet unresolved issues related to virus origin, spread, pathogenesis and disease severity to better prepare for future pandemics. It covers the background to recent advances in influenza genomics and reverse genetics which have allowed the identification of virus virulence factors and the analysis and reconstruction of influenza viruses such as the 1918 Spanish flu strain. This new edition is divided into eight key sections, containing chapters co-written by international experts from both the clinical and scientific communities, covering: Influenza Perspectives Structure and Replication Evolution and Ecology Epidemiology and Surveillance Immunology Vaccines and Vaccine Development Clinical Aspects and Antivirals Public Health Textbook of Influenza is for all those working in the area of influenza including clinical and basic scientists, immunologists, molecular and structural virologists, public health officials and global pandemic control planners.

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