

# Influenza Virology

## Current Topics



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Three times in the last century, influenza viruses have undergone major genetic changes resulting in global pandemics that had devastating effects. The most infamous pandemic was the Spanish Flu which affected up to 25% of the world population and is thought to have killed at least 40 million people in 1918-1919. More recently, two other influenza pandemics, the Asian Flu in 1957 and the Hong Kong Flu in 1968, killed millions of people worldwide. These caused severe disease, not only in the young and the elderly, who are usually very susceptible to influenza, but also among healthy younger persons. In 1997 and 2003 a new influenza A virus of H5N1 subtype emerged in Asia and was transmitted directly from birds to humans with lethal outcomes. Despite monumental efforts to contain them, the H5N1 viruses expanded their territory and caused a major outbreak in wild waterfowl in China in 2005. Indeed, they have even been transmitted to Siberia and Kazakhstan.

Despite extensive, coordinated efforts by various agencies and disciplines, both national and international, we are ill-equipped for a new influenza pandemic. In fact it is highly unlikely that adequate supplies of vaccine for the H5N1 viruses will be prepared prior to the occurrence of the next pandemic. Many countries are stockpiling influenza drugs, with the hope that the inevitable emergence of drug-resistant viruses will not nullify those efforts immediately. To combat the outbreaks that will undoubtedly occur in the near future a better understanding of influenza virus itself, the virus-host interaction, and mechanisms of drug resistance is urgently needed.

In this timely book world renowned scientists (including the 1996 Nobel Prize Winner, Peter Doherty) critically review the most important issues in this rapidly expanding field. Topics covered include analysis of influenza RNP, viral entry and intracellular transport, epidemiology, host range and pathogenicity, antivirals, vaccines, H5 viruses, and much more. Essential reading for all influenza virologists, molecular biologists, public health scientists and research scientists in pharmaceutical companies.

- Chapter 1.** Structure and Function of the Influenza Virus RNP. *Debra Elton, Paul Digard, Laurence Tiley and Juan Ortin*
- Chapter 2.** Entry and Intracellular Transport of Influenza Virus. *Gary R. Whittaker and Paul Digard*
- Chapter 3.** The Proton Selective Ion Channels of Influenza A and B Viruses. *Robert A. Lamb and Lawrence H. Pinto*
- Chapter 4.** Receptor Specificity, Host-Range, and Pathogenicity of Influenza Viruses. *Mikhail N. Matrosovich, Hans-Dieter Klenk and Yoshihiro Kawaoka*
- Chapter 5.** Dendritic Cells: Induction and Regulation of the Adaptive Immune Response to Influenza Virus Infection. *Kevin L. Legge and Thomas J. Braciale*
- Chapter 6.** Quantitative and Qualitative Characterization of the CD8+ T cell Response to Influenza Virus Infection. *Nicole L. La Gruta and Peter C. Doherty<sup>1,2</sup>*
- Chapter 7.** M2 and Neuraminidase Inhibitors: Anti-Influenza Activity, Mechanisms of Resistance, and Clinical Effectiveness. *Larisa Gubareva, and Frederick G. Hayden*
- Chapter 8.** Influenza Vaccines: Current and Future Strategies. *Jacqueline M. Katz, Sanjay Garg, and Suryaprakash Sambhara*
- Chapter 9.** Epidemiology and Control of Human and Animal Influenza. *Kanta Subbarao, David Swayne, and Christopher W. Olsen*
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