

METHODS IN MOLECULAR BIOLOGY™

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Influenza Virus

Methods and Protocols

Edited by

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Preface

Reports of influenza-like illnesses date back to the Middle Ages, and outbreaks of influenza likely afflicted humans long before that. The first influenza virus was isolated in 1933 and influenza viruses have been among the most intensively studied viruses ever since. Influenza virus research led to the identification of the genetic material and viral proteins in the 1970s. The first influenza vaccine was approved in the USA in 1944. Live attenuated vaccine viruses were developed in the 1960s but did not become available for human use until 2003. Influenza virus research also led to the development of two classes of antivirals—ion channel and neuraminidase inhibitors, which were approved in the USA in 1966 and 1999, respectively. In 1999, a method of the artificial generation of an influenza virus was established. This system has been instrumental in the development of novel influenza vaccines, and in the understanding of viral pathogenicity and the functions of viral proteins. This book is intended to summarize the current techniques that have made this progress possible, ranging from protocols for virus isolation, growth, and subtyping to procedures for the efficient generation of any influenza virus. These techniques are used in numerous laboratories around the world and are, thus, the building blocks that underpin almost all influenza virus research.

Influenza viruses continue to threaten humans. Striking reminders include the influenza pandemic of 1918 that killed an estimated 40–50 million people worldwide and may even have affected the outcome of World War I, as well as the recent transmissions of highly pathogenic avian H5N1 influenza viruses to humans, resulting in a case fatality rate of approximately 60%. Are we prepared for future pandemics? The H1N1 pandemic in 2009 was unforeseen, and although vaccines to this novel strain were on the market within 6 months, an even shorter response time would be desirable. To cope with the emergence of novel strains and resistance to existing antivirals, researchers will more than ever have to rely on their ingenuity, expertise, and experience to better understand the mechanisms of influenza pathogenicity and to develop countermeasures. Solid knowledge of the standard techniques described in this book is a small, but important, step towards meeting these challenges.

Madison, WI, USA

*Yoshihiro Kawaoka
Gabriele Neumann*

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