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Cover Illustration. Background: Panel of Figure 5 from Chapter 5, "Functional Analysis of the *N*-Linked Glycans Within the Fusion Protein of Respiratory Syncytial Virus" by Ping Li, Helen W. McL. Rixon, Gaie Brown, and Richard J. Sugrue. Left inset: The morphology of mature respiratory syncytial virus particles. Virus particles were labeled with an antibody against the virus G (attachment) glycoprotein and visualized using electron microscopy. The location of the bound antibody was detected using a second antibody conjugated to 10-nm gold particles, which are visualized as black spots in the image. Right inset: Electron micrograph showing respiratory syncytial virus budding from the surface of infected Hep2 cells..

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Preface

The application of molecular biological techniques in the field of virology over the last 25 years has enhanced our understanding of how viruses interact with their hosts. Such studies have demonstrated that intimate interactions between virus and cell proteins occur during the virus replication cycle. Many of these interactions are mediated via posttranslational modifications, either of virus or host-cell proteins. The addition of carbohydrate molecules, also referred to as glycans, is one of the most important ways in which proteins are modified during virus infection. From the initial stages of cell attachment to the final stages of virus maturation, glycans are involved. Receptor specificity, which governs virus attachment to the host cell and is hence a major determinant of tissue tropism, is in many cases largely dependent on the structure of the glycan moieties present on the cell surface. Additionally, glycans mediate the interaction between many virus proteins and cellular chaperones during transport through the secretory pathyway, thus preventing the formation of misfolded proteins during virus maturation.

Given the increasing importance of glycosylation to the field of virology, it is pertinent and timely to produce a book that describes, and collates, some of the strategies that have been used to study the glycobiology of viruses. The focus of *Glycovirology Protocols* is restricted to glycoproteins, although it is acknowledged that other glycan-modified biomolecules, such as glycolipids, also play an important role during virus replication. The opening chapter provides an overview of glycosylation in relation to virus infection and the generic techniques that are used to analyze and characterize glycoproteins. However, many of these techniques cannot simply be taken "off the shelf," rather they must be modified to suit the specific virus system in question. It is for this reason that expert virologists have been asked to contribute chapters that describe the application of these techniques to their own specific areas of interest. *Glycovirology Protocols* is written for researchers with different levels of experience, from PhD students to senior scientists. It is intended that the information presented in this book will provide insight as to how the techniques of glycobiology can be applied in virology to answer questions that are of interest to the reader.

Richard J. Sugrue

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