
Preface

While filoviruses as a group were first discovered 50 years ago, and ebolaviruses have been known since 1976, many of these viruses' secrets remained hidden until the use of molecular biological techniques became widespread at the end of the 1980s. Since then, advances, first in sequencing and cloning and then in life cycle modeling and reverse genetics, animal modeling, and most recently in imaging techniques, have provided successive layers of insight into the biology and pathogenesis of these agents. Further, as increasing numbers of outbreaks have been identified, culminating with the recent ebolavirus epidemic of unprecedented proportions in West Africa that threatened to spread internationally to an extent that was previously unimaginable, there has been a heightened interest in the development and advancement of techniques for diagnostics, high-throughput antiviral screening, and vaccine development. It has also made clear the need for a better understanding of the ecology of these agents and the development of tools for understanding the immune response in animal species other than laboratory standard animals.

This book seeks to provide a sampling of key methods that have supported these advancements in the field of ebolavirus molecular biology. In retrospect, it seems clear that, as with many other virus families, much of what we know of ebolavirus biology is the direct result of the widespread implementation of molecular biological methods, with the advancements in our knowledge mirroring closely the development and availability of new techniques. Similarly it is clear that the individual protocols within this volume can be appreciated as part of the continuing spectrum of assays that fuel filovirus research, and we hope that access to these detailed protocols, outlining many of the important techniques currently being used by researchers, will also help to propel new research forward into the next decade. Of course such an endeavor is not possible without the support of a large group of outstanding experts who are willing to openly share their developments with one another, and we are fortunate that this is the case in the filovirus research community. Indeed, this collaborative spirit was clearly demonstrated recently during the international response to the ebolavirus epidemic in West Africa, which saw filovirus research groups from across the globe coming together to apply their skills and experiences, including openly sharing their results and protocols, to directly help each other and the affected people in West Africa.

We are very happy that all generations of filovirus researchers have come together in the making of this book, including one of the researchers who co-discovered filoviruses more than 50 years ago, many senior researchers who have been instrumental in moving the filovirus field forward over the last 20–30 years, as well as young investigators who are just now bringing new ideas and techniques into the field. We would like to thank all the contributors to this book, and particularly Prof. Takeshi Noda (Kyoto University, Japan) for providing the electron micrograph of an ebolavirus-infected cell for the cover image. Finally, we hope that together we have produced a book that will not only serve as a guide to the next generations of filovirus researchers but also help bring experts from other areas into the filovirus research arena.

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