

## Marburg Virus Faculty

Meeting the acute need for a book determining the crucial elements of bioterrorism preparedness, this is a global perspective of the history and current concepts for bioterrorism, integrating the legal, medical, scientific and public health strategies. It furthermore discusses the role of WHO and international health regulations for bioterrorism preparedness. For microbiologists, epidemiologists, biotechnologists, public health agencies, and pharmacutists.

This book is specifically designed to provide information about various nanocarriers currently developed under the emerging field of nanotheranostics for a sustained, controlled, and targeted co-delivery of diagnostic and therapeutic agents. Diverse theranostic applications of nanotechnology and their limitations are also addressed. It integrates nanobiotechnology with theranostic applications. The combined term nanotheranostics has diverse application particularly in chemotherapy and other infectious diseases. Among other topics addressed are antimicrobial resistance, targeting intra-cellular pathogens, viruses and bacteria, chemotherapy, cancer therapeutics, and inflammatory disorders. This interdisciplinary volume is essential for a diverse group of readers including nanotechnologists, microbiologists, biotechnologists, bioengineering and bioprocess industry.

Zoonotic diseases represent one of the leading causes of illness and death from infectious disease. Defined by the World Health Organization, zoonoses are those diseases and infections that are naturally transmitted between vertebrate animals and man with or without an arthropod intermediate. Worldwide, zoonotic diseases have a negative impact on commerce, travel, and economies. In most developing countries, zoonotic diseases are among those diseases that contribute significantly to an already overly burdened public health system. In industrialized nations, zoonotic diseases are of particular concern for at-risk groups such as the elderly, children, childbearing women, and immunocompromised individuals. The Emergence of Zoonotic Diseases: Understanding the Impact on Animal and Human Health, covers a range of topics, which include: an evaluation of the relative importance of zoonotic diseases against the overall backdrop of emerging infections; research findings related to the current state of our understanding of zoonotic diseases; surveillance and response strategies to detect, prevent, and mitigate the impact of zoonotic diseases on human health; and information about ongoing programs and actions being taken to identify the most important needs in this vital area. In the last several decades, international traffic volume has significantly increased, raising the risk of infectious diseases and their spread. In this important volume, the impact of health issues is explored in connection with travel. Not only does the book explore the risk of diseases such as H1N1 (otherwise known as swine flu), malaria, salmonella, and Legionellosis, it also addresses health regulations for travel to foreign countries, alcohol use and hospitality-related health

problems and issues, medical tourism (patients seeking less expensive medical procedures in countries other than their own), and much more.

Ebola epidemics have had immediate and lasting impact in Africa and beyond, with its high case fatality and societal disruption. Its rapid spread, coupled with the limited knowledge, serves as a recipe for disaster and panic in the community. Health workers are particularly at risk, paying heavily with their lives. Sharing knowledge from various experts in basic sciences that support vaccine and drug development, as well as improving community surveillance and case management, enriches our understanding of this highly fatal and contagious disease. In a world that is fast becoming a global village, communicable diseases from low-resource setting are gradually becoming a global health threat. This book seeks to discuss emerging advances in the Ebola control.

This book illuminates mechanisms of resilience. Threats and defense systems lead to adaptive changes in gene expression. Environmental conditions may dampen adaptive responses at the level of RNA expression. The first seven chapters elaborate threats to human health. Human populations spontaneously invade niche boundaries exposing us to threats that drive the resilience process. Emerging RNA viruses are a significant threat to human health. Antiviral drugs are reviewed and how viral genomes respond to the environment driving genome sequence plasticity. Limitations in predicting the human outcome are described in “nonlinear anomalies.” An example includes medical countermeasures for Ebola and Marburg viruses under the “Animal Rule.” Bacterial infections and a review of antibacterial drugs and bacterial resilience mediated by horizontal gene transfer follow. Chapter 6 shifts focus to cancer and discovery of novel therapeutics for leukemia. The spontaneous resolution of AML in children with Down syndrome highlights human resilience. Chapter 7 explores chemicals in the environment. Examples of chemical carcinogenesis illustrate how chemicals disrupt genomes. Historic research ignored RNA damage from chemically induced nucleic acid damage. The emergence of important forms of RNA and their possible role in resilience is proposed. Chapters 8-10 discuss threat recognition and defense systems responding to improve resilience. Chapter 8 describes the immune response as a threat recognition system and response via diverse RNA expression. Oligonucleotides designed to suppress specific RNA to manipulate the immune response including exon-skipping strategies are described. Threat recognition and response by the cytochrome P450 enzymes parallels immune responses. The author proposes metabolic clearance of small molecules is a companion to the immune system. Chapter 10 highlights RNA diversity expressed from a single gene. Molecular Resilience lists paths to RNA transcriptome plasticity forms the molecular basis for resilience. Chapter 11 is an account of ExonDys 51, an approved drug for the treatment of Duchenne muscular dystrophy. Chapter 12 addresses the question “what informs molecular mechanisms of resilience?” that drives the limits to adaptation and

boundaries for molecular resilience. He speculates that radical oxygen, epigenetic modifications, and ligands to nuclear hormone receptors play critical roles in regulating molecular resilience.

Gene Therapy for Viral Infections provides a comprehensive review of the broader field of nucleic acid and its use in treating viral infections. The text bridges the gap between basic science and important clinical applications of the technology, providing a systematic, integrated review of the advances in nucleic acid-based antiviral drugs and the potential advantages of new technologies over current treatment options. Coverage begins with the fundamentals, exploring varying topics, including harnessing RNAi to silence viral gene expression, antiviral gene editing, viral gene therapy vectors, and non-viral vectors. Subsequent sections include detailed coverage of the developing use of gene therapy for the treatment of specific infections, the principles of rational design of antivirals, and the hurdles that currently face the further advancement of gene therapy technology. Provides coverage of gene therapy for a variety of infections, including HBV, HCV, HIV, hemorrhagic fever viruses, and respiratory and other viral infections Bridges the gap between the basic science and the important medical applications of this technology Features a broad approach to the topic, including an essential overview and the applications of gene therapy, synthetic RNA, and other antiviral strategies that involve nucleic acid engineering Presents perspectives on the future use of nucleic acids as a novel class of antiviral drugs Arms the reader with the cutting-edge information needed to stay abreast of this developing field

The Transformational Medical Technologies (TMT) has been a unique component of the U.S. Department of Defense (DoD) medical biodefense efforts since 2006. Its mission is to advance countermeasure research and development in support of the broader goal of the DoD to protect warfighters from emerging infectious diseases and future genetically engineered biological weapons. The TMT, using advanced science and technology approaches, focused on the development of roadspectrum countermeasures that target common host and pathogen pathways or enhance the host's immune response. Many of these pathogens are lethal or cause such debilitating diseases in humans that it is ethically inappropriate to test the efficacy of these countermeasures in human volunteers. In lieu of human participants, these products may be tested in animals and approved for human use under the provisions of the Food and Drug Administration (FDA)'s 2002 Animal Rule. The reliance on animal models for the development and licensure of medical countermeasures against biothreats is challenging for a number of reasons. The ad hoc Committee on Animal Models for Assessing Countermeasures to Bioterrorism Agents prepared a consensus report that would address the challenges stemming from developing and testing medical countermeasures against biothreat agents in animal models. Animal Models for Assessing Countermeasures to Bioterrorism Agents evaluates how well the existing TMT-employed or candidate animal models reflect the pathophysiology, clinical picture, and treatment of human disease as related to the agents of interest. The report addresses the process and/or feasibility of developing new animal models for critical biodefense research, placing emphasis on the need for a robust and expeditious validation process in terms of the FDA's Animal Rule. The report also evaluates alternatives to the use of animal models based on the premise of the Three Rs.

Viral hemorrhagic fevers have captured the imagination of the public and made their way into popular books and movies by virtue of their

extreme virulence and mysterious origins. Since 2001, concerns have grown about the potential use of many hemorrhagic fever viruses as biological weapons. This has led to a resurgence in research to develop improv

Ebola: Clinical Patterns, Public Health Concerns is a concise description and discussion of the Ebola virus and disease. The intended audience is medical practitioners, including those working in endemic areas as well as health-facility planners and public health practitioners. The book fills an important gap between large texts covering not only Ebola but other hemorrhagic fever viruses and brief pamphlet-style publications on the public health aspects of the infection. In light of the recent large outbreak in West Africa, this book is a part of the developing foundation needed to deal with emerging diseases.

“A frightening and fascinating masterpiece of science reporting that reads like a detective story.” —Walter Isaacson In 1976 a deadly virus emerged from the Congo forest. As swiftly as it came, it disappeared, leaving no trace. Over the four decades since, Ebola has emerged sporadically, each time to devastating effect. It can kill up to 90 percent of its victims. In between these outbreaks, it is untraceable, hiding deep in the jungle. The search is on to find Ebola’s elusive host animal. And until we find it, Ebola will continue to strike. Acclaimed science writer and explorer David Quammen first came near the virus while he was traveling in the jungles of Gabon, accompanied by local men whose village had been devastated by a recent outbreak. Here he tells the story of Ebola—its past, present, and its unknowable future. Extracted from *Spillover* by David Quammen, updated and with additional material.

The bestselling landmark account of the first emergence of the Ebola virus. Now a mini-series drama starring Julianna Margulies, Topher Grace, Liam Cunningham, James D'Arcy, and Noah Emmerich on National Geographic. A highly infectious, deadly virus from the central African rain forest suddenly appears in the suburbs of Washington, D.C. There is no cure. In a few days 90 percent of its victims are dead. A secret military SWAT team of soldiers and scientists is mobilized to stop the outbreak of this exotic "hot" virus. The Hot Zone tells this dramatic story, giving a hair-raising account of the appearance of rare and lethal viruses and their "crashes" into the human race. Shocking, frightening, and impossible to ignore, The Hot Zone proves that truth really is scarier than fiction.

In the late summer of 1967, several patients suffering from a severe disease were admitted to the Department of Medicine of the Marburg University. It soon became obvious that the illness was a hitherto unknown infectious disease. The number of afflicted patients increased to 23. Several cases were observed in Frankfurt/Main at the same time and, some weeks later also in Belgrade, Yugo slavia. Common to all the patients was previous contact with the blood or tissues of *Cercopithecus aethiops*, the vervet monkey. Altogether 31 people became ill and 7 died. It was soon apparent that the infectious agent was neither bacterial nor rickettsial in origin but that a viral etiology was probable. Most of the known viral diseases were excluded and the infectious agent was shown to be a hitherto unknown virus with many peculiar characteristics: it infects guinea pigs but not adult mice and is larger than known viruses and of different shape. This agent was called the "Marburg virus" since most of the cases had occurred in Marburg and the greater part of the laboratory work leading to the detection of the virus was performed in Marburg.

“Paul Farmer brings his considerable intellect, empathy, and expertise to bear in this powerful and deeply researched account of the Ebola outbreak that struck West Africa in 2014. It is hard to imagine a more timely or important book.” —Bill and Melinda Gates “[The] history is as powerfully conveyed as it is tragic . . . Illuminating . . . Invaluable.” —Steven Johnson, The New York Times Book Review In 2014, Sierra Leone, Liberia, and Guinea suffered the worst epidemic of Ebola in history. The brutal virus spread rapidly through a clinical desert where basic health-care facilities were few and far between. Causing severe loss of life and economic disruption, the Ebola crisis was a major

tragedy of modern medicine. But why did it happen, and what can we learn from it? Paul Farmer, the internationally renowned doctor and anthropologist, experienced the Ebola outbreak firsthand—Partners in Health, the organization he founded, was among the international responders. In *Fevers, Feuds, and Diamonds*, he offers the first substantive account of this frightening, fast-moving episode and its implications. In vibrant prose, Farmer tells the harrowing stories of Ebola victims while showing why the medical response was slow and insufficient. Rebutting misleading claims about the origins of Ebola and why it spread so rapidly, he traces West Africa's chronic health failures back to centuries of exploitation and injustice. Under formal colonial rule, disease containment was a priority but care was not – and the region's health care woes worsened, with devastating consequences that Farmer traces up to the present. This thorough and hopeful narrative is a definitive work of reportage, history, and advocacy, and a crucial intervention in public-health discussions around the world. Since the 2014 Ebola outbreak many public- and private-sector leaders have seen a need for improved management of global public health emergencies. The effects of the Ebola epidemic go well beyond the three hardest-hit countries and beyond the health sector. Education, child protection, commerce, transportation, and human rights have all suffered. The consequences and lethality of Ebola have increased interest in coordinated global response to infectious threats, many of which could disrupt global health and commerce far more than the recent outbreak. In order to explore the potential for improving international management and response to outbreaks the National Academy of Medicine agreed to manage an international, independent, evidence-based, authoritative, multistakeholder expert commission. As part of this effort, the Institute of Medicine convened four workshops in summer of 2015 to inform the commission report. The presentations and discussions from the Workshop on Research and Development of Medical Products are summarized in this report. Despite being recognized and fought against over countless centuries, human viral pathogens continue to cause major public health problems worldwide—killing millions of people and costing billions of dollars in medical care and lost productivity each year. With contributions from specialists in their respective areas of viral pathogen research, *Molecular Detection of Human Viral Pathogens* provides a reliable reference on molecular detection and identification of major human viral pathogens. Each chapter briefly reviews the classification, epidemiology, clinical features, and diagnosis of one related viral pathogen or a group of them. The clinical sample collection and preparation procedures are outlined, and a selection of representative stepwise molecular detection protocols is covered. The chapters conclude with a discussion on further research requirements relating to improved diagnosis. With its judicious selection of streamlined, ready-to-use protocols for major human viral pathogens—including commercial kits—*Molecular Detection of Human Viral Pathogens* is an indispensable tool for medical, veterinary, and industrial laboratory scientists involved in virus determination.

This is the first comprehensive review of the world literature on filovirus research and provides the most extensive bibliography of the subject yet published. There is special emphasis on foreign literature that has never been

summarized. Every aspect of filovirus research, including their history, epidemiology, clinical picture, pathology, molecular biology, and political aspects are reviewed in detail.

This volume covers major aspects of Crimean-Congo hemorrhagic fever (CCHF) and the virus which causes it. Chapters are written by leading experts in their fields and detail historical, public health, epidemiological, and clinical aspects of CCHF and the genetics and molecular biology of the virus. Additional chapters focus on disease control, tick vectors and infection among animals, both natural and experimental.

With a New Chapter and Updated Epilogue on Coronavirus A Financial Times Best Health Book of 2019 and a New York Times Book Review Editors' Choice "Honigsbaum does a superb job covering a century's worth of pandemics and the fears they invariably unleash." —Howard Markel, MD, PhD, director of the Center for the History of Medicine, University of Michigan How can we understand the COVID-19 pandemic? Ever since the 1918 Spanish influenza pandemic, scientists have dreamed of preventing such catastrophic outbreaks of infectious disease. Yet despite a century of medical progress, viral and bacterial disasters continue to take us by surprise, inciting panic and dominating news cycles. In *The Pandemic Century*, a lively account of scares both infamous and less known, medical historian Mark Honigsbaum combines reportage with the history of science and medical sociology to artfully reconstruct epidemiological mysteries and the ecology of infectious diseases. We meet dedicated disease detectives, obstructive or incompetent public health officials, and brilliant scientists often blinded by their own knowledge of bacteria and viruses—and see how fear of disease often exacerbates racial, religious, and ethnic tensions. Now updated with a new chapter and epilogue.

Significant advances have been made in animal model development for biological research since the publication of the first edition of this volume, and the ramifications of the FDA's Animal Efficacy Rule have become better understood in the scientific community. With each chapter completely updated with the latest research findings, *Biodefense Research Methodology and Animal Models, Second Edition* spans the spectrum of coverage from basic research to advanced development of medical countermeasures. Topics discussed in this volume include: A history of biological agents as weapons, from the use of corpses to contaminate water supplies to modern day anthrax attacks Concepts and strategies involved in biowarfare and bioterrorism The development, validation, and importance of animal models in biodefense research Infectious disease aerobiology Studies involving anthrax, glanders, plague, tularemia, Q fever, alphaviruses, orthopoxviruses, and a new chapter on brucellosis Animal models for viral hemorrhagic fevers Botulinum and Ricin toxins Staphylococcal and streptococcal superantigens As the scientific community works diligently to protect the world's population from the misuse of infectious organisms and toxins, it is imperative that researchers stay abreast of the latest techniques for biodefense research. Exploring in vivo and in vitro assays, this volume brings researchers up to date on

the latest information on bacterial and viral infectious agents and biological toxins considered to pose the greatest threats to public safety. In addition, the contributors take a step toward minimizing the use of animals in further experiments by presenting documented findings that can be built upon.

This report formally transmits the briefing in response to section 247d-6c of title 42 of the United States Code. The statute required the Comptroller General to examine the Department of Health and Human Services' (HHS) support for the development and procurement of and authority for the emergency use of medical countermeasures to address chemical, biological, radiological, and nuclear threats to public health, and provide the results to the congressional committees by July 21, 2009. HHS determines priorities for medical countermeasure procurement based on those chemical, biological, radiological, and nuclear agents that have been identified by the Department of Homeland Security (DHS) as posing a material threat to the U.S. population that could affect national security. Tables.

Biosafety in the Laboratory is a concise set of practical guidelines for handling and disposing of biohazardous material. The consensus of top experts in laboratory safety, this volume provides the information needed for immediate improvement of safety practices. It discusses high- and low-risk biological agents (including the highest-risk materials handled in labs today), presents the "seven basic rules of biosafety," addresses special issues such as the shipping of dangerous materials, covers waste disposal in detail, offers a checklist for administering laboratory safety--and more.

A profusely illustrated history of one of the hottest medical/biological sciences of all: virology – personalized in crediting the people who began the science concerned with invisible mysterious disease agents, and continuing to cite those who are still unraveling the nature of many of the most important pathogens of today.

Molecular Detection of Animal Viral Pathogens presents expert summaries on state-of-the-art diagnostic approaches for major animal viral pathogens, with a particular emphasis on identification and differentiation at the molecular level. Written by specialists in related research areas, each chapter provides a concise overview of an individual virus

First discovered in 1976, and long regarded as an easily manageable virus affecting isolated rural communities, Ebola rocketed to world prominence in 2014 as a deadly epidemic swept through Guinea, Sierra Leone, and Liberia in West Africa. Thousands of people died as the extraordinarily contagious disease spread rapidly from villages to urban centres. Initial quarantine responses proved often too little and too late, and the medical infrastructure of the affected countries struggled to cope. By August 2014, several months after the start of the outbreak, the WHO declared the epidemic a public health emergency and international aid teams and volunteers began to pour in. But halting the epidemic proved to be hugely challenging, not only in terms of the practicalities of dealing with the sheer numbers of patients carrying the highly infectious virus, but in dealing with social and cultural barriers. The author, Dorothy Crawford, visited Sierra Leone while the epidemic was ongoing and met with those on the frontline in the fight against the virus. In Ebola Crawford combines personal accounts from these brave medical workers with the

latest scientific reports to tell the story of the epidemic as it unfolded, and how it has changed our understanding of the virus. She looks at its origin and spread, the international response, and its devastating legacy to the health of those living in the three worst affected countries. She describes the efforts to prevent international spread, the treatment options for Ebola, including the drug and vaccine trials that eventually got underway in 2015, and the sensitive issue of running trials of experimental therapies during a lethal epidemic. Our understanding of the Ebola virus continues to develop as long-term health problems and complications following recovery from the disease are being identified. Epidemics of Ebola or other dangerous microbes will continue to threaten the world regularly. Already concerns have been raised by the possible impact of the Zika virus. What lessons have been learnt from Ebola? How, asks Crawford, might we prevent a repeat of the awful suffering seen in 2014-16?

The book Ebola is a relevant resource of knowledge about various aspects of the Ebola virus (EBOV) and the related disease. Many experts from different fields of science and from different parts of the world contributed to the creation of this book. The book contains valuable information about firsthand experience of managing Ebola virus disease (EVD) in Third World countries and offers the best practices to handle possible pandemic outbreaks of Ebola. Detailed analysis of EBOV genome is also given, with the description of EBOV pathology supported with structural information, and in addition, the various tasks and strategies for the development of an effective anti-Ebola cure are proposed.

The Virology Methods Manual is a comprehensive source of methods for the study, manipulation, and detection of viruses. Edited by Brian Mahy and Hillar Kangro, this work describes the most up-to-date, definitive techniques, provided by experts in each area, and presented with easy-to-use, step-by-step protocols. This new manual will satisfy the needs of virologists and all those working with viruses who need a practical guide to methods that work! Provides up-to-date techniques by experts worldwide Presents common, step-by-step protocols in an attractive, easy-to-use fashion Contains useful appendices including virus taxonomy, metabolic inhibitors, and Bio-safety in the virology laboratory

The Ebola and Marburg viruses are a pair of filoviruses that are among the most lethal hemorrhagic viruses on the planet. The authors present a review of past and current research into these pathogens, including 12 papers addressing the structure of the viral proteins; genomic replication; molecular mechanisms of entry; pathogenesis in nonhuman primates, guinea pigs, and mice; virus modulation of innate immunity; and cellular and molecular mechanisms of Ebola pathogenicity and related approaches to vaccine development.

How to Prevent the Spread of EBOLA: Effective Strategies to Reduce Facility Acquired Infections and Reduce Super Bugs Outbreak. This book is divided into ten different sections targeting critical issues of concern about Ebola and the processes of preventing Ebola spread as a nosocomial infection. It starts with allaying people's fear and discussing facts about the clinical aspects of Ebola virus infection. It discusses different types of Ebola viruses and their pathogenesis; routes of infection; clinical manifestations and progression of the disease; immunopathology and cellular toxicity;

progressive tissue damage and multi-organ failures; effective management of the disease; and the discussion of some case studies. This Ebola monograph also discusses some of the lingering questions raised by the public about Ebola and addresses these controversial issues with facts. Some of the questions discussed include, What are the indicators for the survivability of the Ebola virus once a patient is infected? Can Ebola virus be aerosolized? What are the differences between the acute phase of the illness and the subclinical, asymptomatic, or nonclinical Ebola virus infections? Where was the first Ebola infection, in West Africa or in Europe? Can the Ebola virus infection be caught through kissing an infected person? When a blood test is negative for Ebola virus, is a patient free of Ebola virus? Can Ebola virus be transmitted through breast milk, semen or vaginal fluids? Was the virulent Ebola virus able to enter the human population by an accidental release due to a lab accident? Can the outbreak of Reston Ebola virus infections in the Philippines among nonhuman primates be dangerous to human population with the evidence of abortive infection in some farm workers? What is the nature of the current virus epidemic in U.S. farms, killing millions of piglets? Is this epidemic swine virus similar to Ebola and how dangerous is it to the human population? What are the lessons learned from the clinical management of Ebola patients that can be applied to the treatment of other viral infections like the Bourbon virus newly discovered in Kansas? What is the chronicity of Ebola infection and the long term effects, after clinical cure? For answers to these questions and more, read the book, *How to Prevent the Spread of Ebola Virus Infection*. Many healthcare institutions including hospitals, clinics, physician's offices, dentist's offices will find this book very useful to help prevent the rise of facility-acquired infections. Over 600 pages of leading medical journal articles are reviewed in this book giving scientific explanations for the questions raised by Ebola virus infection. In reviewing these research reports, it is evident, that we have effective treatment for Ebola virus infection as a multi-pronged approach in the process of effective clinical management of the disease.

The filoviruses, including Marburg and Ebola, express a single glycoprotein on their surface, termed GP, which is responsible for attachment and entry of target cells. Filovirus GPs differ by up to 70% in protein sequence, and no antibodies are yet described that cross-react among them. Here, we present the 3.6 Å crystal structure of Marburg virus GP in complex with a cross-reactive antibody from a human survivor, and a lower resolution structure of the antibody bound to Ebola virus GP. The antibody, MR78, recognizes a GP1 epitope conserved across the filovirus family, which likely represents the binding site of their NPC1 receptor. Indeed, MR78 blocks binding of the essential NPC1 domain C. We find that these structures and additional small-angle X-ray scattering of mucin-containing MARV and EBOV GPs suggest why such antibodies were not previously elicited in studies of Ebola virus, and provide critical templates for development of immunotherapeutics and inhibitors of entry.

This issue of Clinics in Laboratory Medicine, edited by Drs. Nahed Ismail, A. William Pasculle, and James Snyder, will cover a wide variety of Emerging Pathogens. Topics covered in this issue include, but are not limited to West Nile Virus; Zika Virus; Ebola and Marburg Hemorrhagic Fever; Rift Valley Fever; Carbapenem Resistant Enterobacteriaceae; Clostridium Difficile; and Chikungunya, among others.

The most recent Ebola epidemic that began in late 2013 alerted the entire world to the gaps in infectious disease emergency preparedness and response. The regional outbreak that progressed to a significant public health emergency of international concern (PHEIC) in a matter of months killed 11,310 and infected more than 28,616. While this outbreak bears some unique distinctions to past outbreaks, many characteristics remain the same and contributed to tragic loss of human life and unnecessary expenditure of capital: insufficient knowledge of the disease, its reservoirs, and its transmission; delayed prevention efforts and treatment; poor control of the disease in hospital settings; and inadequate community and international responses. Recognizing the opportunity to learn from the countless lessons of this epidemic, the National Academies of Sciences, Engineering, and Medicine convened a workshop in March 2015 to discuss the challenges to successful outbreak responses at the scientific, clinical, and global health levels. Workshop participants explored the epidemic from multiple perspectives, identified important questions about Ebola that remained unanswered, and sought to apply this understanding to the broad challenges posed by Ebola and other emerging pathogens, to prevent the international community from being taken by surprise once again in the face of these threats. This publication summarizes the presentations and discussions from the workshop.

Praise for the Series: "This serial... is well known to virologists. It is a valuable aid in maintaining an overview of various facets of the rapidly expanding fields of virology... Timely, informative, and useful to student, teacher, and research scientist." --American Scientist "A mandatory purchase for all types of comprehensive libraries, both public and university, as well as for those interested in or doing research in the field of virology." --Military Medicine

Among the topics covered are: Virus-induced immunopathology Filoviruses Molecular characterization of pestiviruses Transactivation of cellular genes by hepatitis B virus proteins Principles of molecular organization, expression, and evolution of closteroviruses Primate T lymphotropic oncoretroviruses Replication of positive-stranded RNA viruses of plants and animals

Are you fascinated by sickness and how it spreads? Do you have the urge to help people suffering from diseases both known and unknown? Do you ever wonder how vaccines and cures are developed? If so, a career as an infectious disease specialist might be for you! Through interviews and actual case studies, you'll learn what it's like to be an infectious disease specialist and discover the role they play in modern medicine.

[Copyright: b691d24136caeed466dc670c21662ef0](https://www.pdfdrive.com/marburg-virus-faculty-bookmarks-file-pdf-b691d24136caeed466dc670c21662ef0.html)