Vaccinology: An Essential Guide

This book provides detailed overviews of a range of topics necessary for understanding vaccines, including their history, their impact on human and animal health, host immune response and correlates of immune protection, and vaccine development from identification of vaccine antigens through full regulatory review and approval. As described in the preface, its purpose is to provide “a framework for educating the next generation of vaccinologists and [it] is primarily aimed at advanced undergraduate, graduate, veterinary, and medical students.” The book succeeds admirably in attaining this goal. In addition to providing detailed insight into the process of vaccine development, it also offers important background on infectious disease epidemiology, including disease transmission, herd immunity, eradication, immunopathogenesis, and the social, ethical, and political aspects of disease control through the use of vaccines. It covers these topics well for both human and veterinary vaccines, either by incorporating information on both topics into a single chapter or by describing licensed human and veterinary vaccines in separate chapters.

Each chapter begins with a list of abbreviations, key terms, and definitions and finishes with a concise summary, using bullet points. The excellent tables and illustrative figures in each chapter present useful supplemental information. Several chapters merit special comment, including the first one, which provides an excellent, concise review of major vaccines, the diseases they prevent, and their impact over time. The chapter on vaccine adjuvants offers detailed insight into their mechanisms of action and the broad array of adjuvants used in human and veterinary vaccines. Details are also provided on vaccine vectors, both viral and bacterial, and novel delivery systems, such as plant vectors, the bacterial ghost system, and strategies for antigen encapsulation and presentation. The reviews of licensed human and veterinary vaccines are generally comprehensive but with a few gaps; for example, limited information is provided on the Neisseria meningitidis type B vaccine. The veterinary vaccine chapter contains a brief but highly interesting description of the importance of vaccines for use in large-scale commercial fish farming and the challenges associated with their development and delivery. The chapters describing regulatory pathways for vaccine development, vaccine manufacturing, and clinical evaluation of vaccines provide outstanding overviews of the many components of vaccine development and approval processes. Another chapter offers in-depth information on vaccine recommendations for routine immunization, travelers to endemic regions, and high-risk populations. A nice summary of vaccine safety is also provided, including the effectiveness of active and passive surveillance and potential types of phase IV, postmarketing studies.

Despite a few minor problems, including slightly outdated data on the impact of vaccines in humans (only through 2009), some repetition of certain concepts (which may be reasonable, given the need to make sure key concepts are effectively conveyed and understood), and limited emphasis on the impact of and response to antivaccine campaigns, this book is a highly practical textbook for medical, veterinary, pharmacy, and public health students. It can also serve as a useful reference for practicing physicians and veterinarians who would like to “boost” their knowledge of vaccines.

Note
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