Epstein-Barr Virus (Infectious Disease and Therapy)

Alex Tselis and Hal B. Jenson, editors

Informa Healthcare, New York, New York 2006
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Epstein-Barr virus (EBV) was the first recognized human tumor virus, but it is not the causative agent for the tumor in which it was discovered, Burkitt lymphoma. Common to all Burkitt lymphomas, endemic or sporadic, are distinctive chromosomal translocations that reactivate expression of the *c-myc* protooncogene and comprise the primary oncogenic mechanism.

EBV is at least a contributory cofactor in endemic Burkitt lymphoma, but the virus is detected in <20% of sporadic cases in the United States. EBV does cause infectious mononucleosis, hairy leukoplakia, and B-lymphoproliferative neoplasms in immunocompromised persons. In addition, the early and utterly consistent presence of monoclonal EBV episomes in nasopharyngeal carcinoma worldwide suggests a crucial role for the virus in that neoplasm. While tantalizing, associations with other diseases, well reviewed in this volume, are inconsistent and suggest that the virus may have another role beyond the etiologic, namely, by affecting the phenotype of already existing tumor cells and possibly propelling tumor progression.

This book is assembled mostly from a clinical perspective, and useful chapters on several of the EBV diseases bring together information not easily found elsewhere. Well-informed chapters on the virology and epidemiology of EBV infection are also included. One of the editors (whose list of milestones displays the clinical emphasis of the book) has provided a nice historical summary.

As is usual with such compilations, the editors leave it to the contributors to speak for themselves, and the quality of the chapters is uneven. Some fall short in citation of primary sources or favor the author's view rather than one that weighs all the evidence. Withal it is a useful book, and having the less often discussed associations such as T-cell lymphomas and leiomyosarcomas assigned a place alongside authoritative chapters on the classic associations, nasopharyngeal carcinoma and Burkitt lymphoma, is convenient. The volume ends with a chapter on an EBV vaccine, which remains elusive after many years. In contrast, the penultimate chapter includes a brief summary of some successes with adoptive immunotherapy for posttransplant lymphoproliferative disease, which is generally refractory to conventional treatment. This volume is worth having for the cross-section of knowledge and developments in the EBV field it presents.

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The Power of Plagues

Irwin W. Sherman

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The purpose of this book is to make the science of epidemic diseases accessible and understandable; to guide the general reader through the maze of contagious diseases, their past importance, the means by which we came to understand them, and how they may affect our future. This commentary on general and disease-specific concerns covers the nature of plagues; plagues, the price of being sedentary (an evolutionary view); 6 plagues of antiquity (urinary schistosomiasis, the plague of Athens, malaria in Rome, the Antonine plague, the plagues of Cyprian and Justinian); bubonic plague; AIDS (including a history of virology and an account of leukocyte function); typhus; malaria (plus an explanation of sickle cell disease and genetics); cholera; smallpox; preventing plagues (the immune system, with a coda on vaccine development); the plague protectors (antisepsis and antimicrobial drugs); syphilis; tuberculosis; leprosy; 6 plagues of Africa (sleeping sickness, river blindness, guinea worm, yellow fever, malaria, and hookworm) with the history of exploration and exploitation of this continent; plagues without germs (pellagra, beriberi, scurvy, and rickets); and emerging plagues (rodent-borne, West Nile virus, bovine spongiform encephalopathy and Creutzfeldt-Jakob disease, and influenza). The text covers not only the geography, history, microbiology, and physiology of these infections but also their influence on plastic art, movies, literature, and music (with a special fondness for nursery rhymes).

Surprisingly, the role of contemporary epidemiologic methods and governmental institutions is not examined. No explanation is included of how present-day public health officials go about detecting a problem, how they define an epidemic, how they use data such as incidence or attack rates to identify the cause, and how laws and regulations (e.g., vaccine requirements for school entry and rules for production of food and biological materials) are indispensable for disease prevention. The text would have profited from another round of editing to modify overly forceful generalizations, tighten the discussion, and check for historical and medical accuracy. For example, acyclovir is not AZT, and AZT was not available for first-line treatment of AIDS in the early 1980s; cholera is not slowly creeping into the Western Hemisphere, but it produced large epidemics in Central and South America in the 1990s; Figure 9.7B is not an antivaccination statement from Boston in 1902 but, as the engraving itself indicates, a provaccine statement from England in 1898; vaccination with *Mycobacterium bovis* BCG does not cause the tuberculin test result to be negative; and malaria control efforts in the United States were not interrupted by World War II but, on the contrary, were enhanced by the creation of an agency called Malaria Control in War Areas.

This is a concise and clear account of the biologic and historical determinants of epidemic diseases. It is marred by a small number of factual errors and a failure to include epidemiologic and public health methods as components of the equation that determines the power of plagues.

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Molecular Principles of Fungal Pathogenesis

Joseph Heitman, Scott G. Filler, John E. Edwards Jr, and Aaron P. Mitchell, editors

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This book offers advanced treatment of a broad selection of topics in molecular medical mycology authored by leading investigators. It assumes a foundation of knowledge of mycotic pathogens and is suitable for the reader who is well-grounded in molecular microbiology. It is highly recommended for investigators planning to conduct medical mycology research. The book is divided into 5 sections: General Principles, Model Systems, Specific Pathogens, The Host, and Future Directions. Only selected highlights are described here because of space limitations.

The book reviews the development of transforming and gene-silencing methods for identifying virulence determinants. An overview of *Candida albicans* virulence underlines that molecular subtyping has elucidated 3 major clades, which differ in their potential for producing superficial versus deep-seated infection. The first step in pathogenesis is adherence to host tissues. The endothelial and epithelial specificity of members of the *C. albicans* Als family of adherence molecules is defined by the adherence profile of null mutants. The discovery through the genome sequence of *C. albicans* mating type locus and the delineation of the unique pathway of a parasexual cycle are discussed. Although the population is largely clonal and seems locked in a diploid state, the species has a demonstrated ability to undergo recombination.

The phylogenetic species concept has led to a better understanding of the lineage of pathogenic fungi, especially for the mitosporic fungi, which have no known sexual stage. The evolution of fungal species, shown by multilocus sequence typing, enabled construction of a phylogenetic tree of all known fungal pathogens with assignments to well-described families and orders.

Mechanisms of resistance to antifungal agents are discussed, including insights from genome sequence analysis and recent clinical observations such as the role of transcription factors in upregulating efflux pumps in the presence of antifungal agents or steroids. How environmental fungi have acquired their pathogenic potential for humans, even those whose immune function is intact, is a puzzle, but clues come from the interaction of fungi with soil-dwelling amebae. Fungi escape endocytosis by converting from yeast to hyphal forms; this not only conditions them for intracellular survival but also suggests how dimorphism may have originated. Transcriptional profiling using microarrays is a powerful tool for identifying genes expressed during mold-to-yeast morphogenesis and host-fungus interactions in infected tissue cultures and biofilms. Interspersed in the book are examples of exploiting this technology to discover key regulatory pathways.

No subject attracts more interest, yet is strewn with more pitfalls, than