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0521832489 - Molecular Pathogenesis of Virus Infections

Edited by P. Digard, A. A. Nash and R. E. Randall

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Molecular pathogenesis of virus infections

Virus and prion diseases remain a major public health threat, in both developed and developing countries. The worldwide HIV pandemic is but one example of a newly emerged virus disease; other potential threats come from exotic viruses such as SARS, Ebola and Hantaan viruses. Older human viruses such as influenza, papilloma, herpes and the hepatitis viruses still cause major health problems. Furthermore, as well as causing acute infections, some viruses may also establish persistent infections which can lead to the development of chronic diseases, including cancer. This symposium book covers central factors that influence the pathogenicity of virus and prion infections. Topics range from innate and adaptive immune responses and virus evasion of host defences to details of selected virus–host interactions, including those involving dengue virus, HIV, influenza viruses, coronaviruses, hepatitis C virus, herpesviruses, papillomaviruses, African swine fever virus and poxviruses.

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Front cover illustration: Coloured scanning electron micrograph of a cluster of
coronavirus particles. Eye of Science / Science Photo Library.

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Viral Pathogenesis. Vincent Racaniello. This lecture will define and discuss the basic principles of viral pathogenesis, the entire process by which viruses cause disease. Viral disease is a sum of the effects on the host of virus replication and of the immune response. Progress in understanding the molecular basis of viral pathogenesis comes largely from studies of animal models. The mouse has become a particularly fruitful host for studying viral pathogenesis because the genome of this animal can be manipulated readily. In some cases, non-human hosts can be infected with the same viruses that infect humans, but close relatives of human viruses must often be used. To infect its host, a virus must first enter cells at a body surface. Virus-Host Interactions. Viruses do not set out to kill their hosts. Virus pathogenesis is an abnormal situation of no value to the virus—the vast majority of virus infections are asymptomatic. However, for pathogenic viruses, a number of critical stages in replication determine the nature of the disease they produce. For all viruses, pathogenic or nonpathogenic, the first factor that influences the course of infection is the mechanism and site of entry into the body (Figure 6.9): Figure 6.9. Sites of virus entry into the body. The course a virus infection follows depends on the biology of the

@article{Horzinek1987MolecularPO, title={Molecular pathogenesis of virus infections}, author={Marian C. Horzinek}, journal={Experientia}, year={1987}, volume={43}, pages={1193-1196} }. Marian C. Horzinek. Although a very wide range of viral diseases exists in vertebrates, certain generalizations can be made regarding pathogenetic pathways on the molecular level. The presentation will focus on interactions of virions and their components with target cells. Using coronaviruses as examples the changes in virulence have been traced back to single mutational events; recombination, however, is likel