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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Regarding the molecular pathogenesis, the hemagglutinin protein (H) plays a crucial role both in the antigenic recognition and the viral interaction with SLAM and nectin-4, the host cells' receptors. These cellular receptors have been studied widely as CDV receptors in vitro in different cellular models. This includes studies on the molecular determinants of virus entry and spreading between cells, besides the development of live attenuated vaccine vectors [34]. CDV proteins have a specific activity regarding virus replication and in the infection cycle. The N protein not only provides the basis of the helical structure of the RNP, but it is also a requisite in some replicative viral processes [54]. Both viruses caused a productive infection of the entire respiratory tract and epithelial cells in the lungs were the major target. Compared to the swine virus, the AIV produced lower virus titers and fewer antigen positive cells at all levels of the respiratory tract. [Show full abstract] further understand the molecular pathogenesis of the 2009 pandemic H1N1 influenza virus, we profiled cellular microRNAs of lungs from BALB/c mice infected with wild-type 2009 pandemic influenza virus A/Beijing/501/2009 (H1N1) (hereafter referred to as BJ501) and mouse-adapted influenza virus A/Puerto Rico/8/1934. (H1N1) (hereafter referred to as PR8) for comparison.