

Viral proteins affect host responses in Nipah virus infection

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Symptoms caused by virulent virus infection in animals are the results of struggles between host defense system and replicating viruses. Nipah virus (NiV), a paramyxovirus, was first identified in 1999 as a zoonotic virus during an outbreak of infection in pigs and humans in Malaysia. NiV infects a wide range of hosts, producing a disease with significant mortality in humans, while the symptoms are less severe in pigs. The molecular mechanisms responsible for the high pathogenicity and distinct virulence profiles among animal species are not yet elucidated. We have previously established a reverse genetic system that enabled the rescue of replicating recombinant NiVs from a cloned cDNA, and suggested that additional factors, other than the cellular receptors, are clearly required for full NiV replication. NiV has accessory proteins (V, C and W), which are suggested to have IFN antagonist activity and be involved in pathogenicity in the other paramyxoviruses. To investigate the role of accessory proteins with regard to regulation of host immune system, we have generated recombinant NiVs lacking V, W or C protein by the reverse genetics system. All the recombinants grew well in cell culture, and suppressed the IFN response as the parental rNiV, thereby indicating that each of the accessory proteins does not significantly affect IFN signaling in infected cells. Meanwhile, significant difference in pathogenicity was observed among the recombinant viruses in experimentally infected animals, suggesting that the viral proteins affect NiV pathogenicity.