

The multiple roles of viral RNA packaging signals and their consequences capsid assembly and evolution

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Single-stranded RNA viruses are a class of pathogens which infect plants, animals, and humans. The assembly of the protective protein container, or capsid, around the viruses' genome takes place via a highly cooperative co-assembly process in which specialized areas such as small stem-loops from within the viral genome, which we term packaging signals (PSs), interact with the capsid shell and facilitate efficient assembly. In this talk I will highlight some of my work with stochastic assembly models which have been used to examine the multiple cooperative roles that PSs play during assembly, and how their presence in the genome also allows for regulation of the life-cycle as a whole. Using these assembly models, I will also explore how the requirement for these PS sites to be present within the genome impacts on the evolution of the virus and the potential for escape mutants to evolve from drugs which target these sites.