

Microsymposium

MS110.O01

The Icosahedral ϕ X174 Phage Forms a Tail Structure Essential for Infectivity

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PhiX174 is a small circular ssDNA icosahedral phage of known structure (McKenna et al., 1992). The infectious viral capsid consists of 60 copies of the major capsid protein F, 60 copies of the spike protein G, 60 copies of the DNA binding protein J as well as about 12 copies of the DNA pilot protein H. We have shown that the H protein can assemble in vitro and in vivo into tubes that are wide enough to allow the passage of two antiparallel strands of ssDNA. We will give details of our mutational and cryo electron tomographic analyses showing that these tubes are required for the translocation of the viral genome into the cytoplasm of the E.Coli host. Thus the mechanism of infection of tail-less phages like phiX174 and of tailed phages may be a case of convergent evolution.

[1] McKenna, R., Xia, D., Willingmann, P., Ilag, L. L., Krishnaswamy, S., Rossmann, M. G., Olson, N. H., Baker, T. S. & Incardona, N. L. (1992). *Nature* 355:137-143.

Keywords: ϕ X174, tail structure