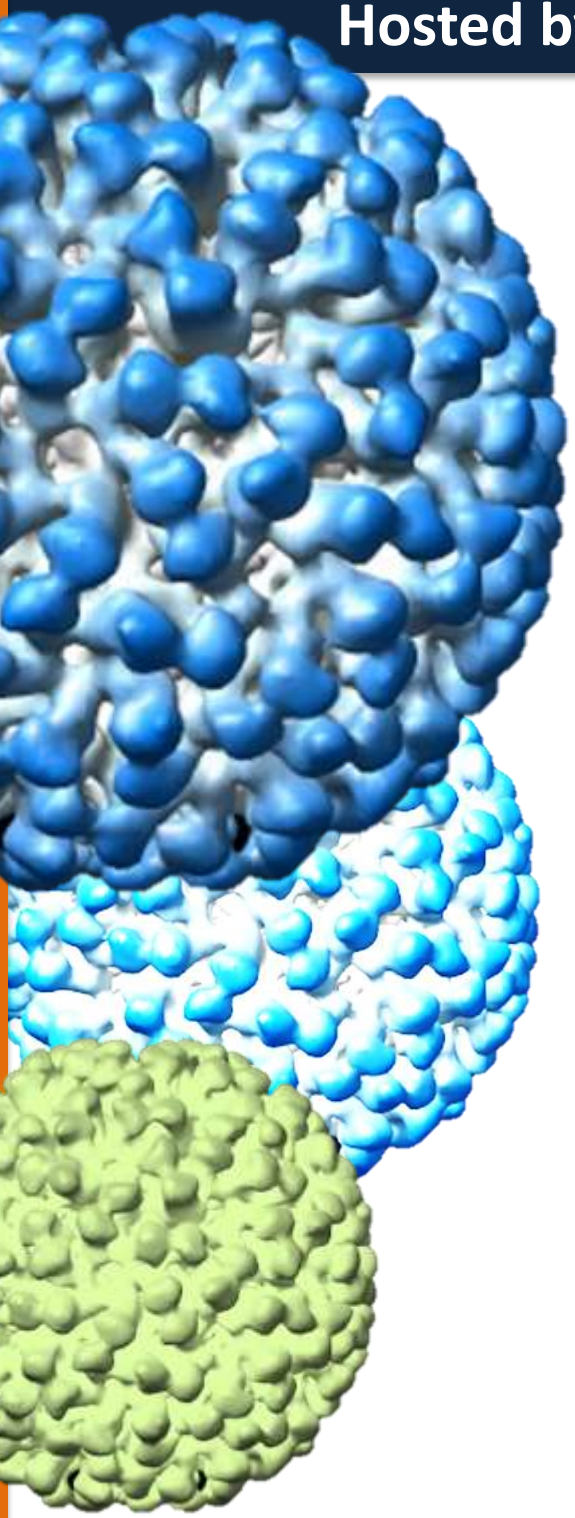
NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

SEMINAR

**Mon, 18 Nov 2013 | 4pm | DBS Conference Room 1**

**Hosted by A/P Ganesh Anand**



# Biophysical Studies of Eukaryotic Virus Maturation: Insights into Elegantly Programmed Nano-machines

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Virus particles with quasi-equivalent surface lattices (i.e. identical gene products in different quaternary structure environments) often assemble as a fragile, spherical shell in which subunits are properly positioned on the surface lattice with differences in the environments minimized. Quasi-equivalent subunit contacts then differentiate during particle maturation, creating a robust, faceted particle with subunits in dramatically different local environments. Nudaurelia Capensis ω Virus (NωV) is a eukaryotic, quasi-equivalent virus, with a T=4 surface lattice, where maturation is dramatic (a change in particle size of 100Å) and is novel in that it can be investigated in vitro. I describe the use of X-ray crystallography, molecular genetics, biochemistry, computational chemistry, Small Angle X-ray Scattering, and electron cryo-microscopy and image reconstruction (CryoEM), to characterize maturation intermediates, an associated auto-catalytic cleavage, the kinetics of morphological change and to demonstrate that regions of NωV subunit folding are maturation-dependent and occur at rates determined by their quasi-equivalent position in the capsid. We seek, in the near term, to describe intermediates in maturation with Hydrogen-Deuterium Exchange, characterizing subunit changes and interactions at a resolution not achievable with direct structural methods.

Artwork by Ann Nee, DBS, NUS