



Department of Biological Sciences
Seminar Announcement

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Structure and maturation of a dsDNA bacteriophage capsid formed by topologically linked protein rings

The crystal structure of the double-stranded DNA bacteriophage HK97 mature empty capsid was determined at 3.4Å resolution by crystallography. The 660Å diameter icosahedral particle contains 420 subunits with a novel fold. The final capsid maturation step is an auto-catalytic reaction that creates 420 isopeptide bonds *between* proteins. Each subunit is joined to two of its neighbors by ligation of the side chain Lys169 to Asn356. This generates 12 pentameric and 60 hexameric rings of covalently joined subunits that loop through each other, creating protein chainmail: topologically linked protein catenanes arranged with icosahedral symmetry. Catenanes are a new paradigm for protein structure and a novel stabilization mechanism for the very thin capsid. HK97 undergoes a dramatic expansion step during its assembly and maturation. We have modeled time resolved cryoEM images of intermediates in the expansion with the x-ray model determined for the mature form. We also characterized the transition with fluorescence and CD spectroscopy, low angle solution x-ray scattering and biochemistry.

Date: 3 Oct 2003, Fri
Time: 4 pm
Venue: LT 20
Host: Prof Hew Choy Leong



All are welcome