

POLYMER SEMINAR

THIS SEMINAR WILL BE HELD IN 56-114

PROF. R. J. (RENKO) DE VRIES
WAGENINGEN UR (THE NETHERLANDS)



“Supramolecular Design of a Minimal Coat-Protein for an Artificial Virus”

Summary

Virus particles are highly effective vehicles to deliver genetic material into susceptible host cells. A necessary condition highlighted by theoretical models for the successful formation of infective virus particles is precisely tuned co-operativity of the self-assembly process. There have been many attempts to construct self-assembling virus-like particles but to date the key property of cooperativity has not been explicitly incorporated in any design of artificial viruses. Here we show the rational design of a minimal viral coat protein based on simple polypeptide domains which do feature precise control over the co-operativity of its co-assembly with single DNA molecules into rod-shaped virus-like-particles (VLPs). We confirm the validity of our design principles by showing that the kinetics of self-assembly of our VLPs follows our previous model for Tobacco Mosaic Virus (TMV) assembly. Mature VLPs protect DNA against enzymatic degradation and transfect cells with considerable efficiency, making them promising scaffolds for delivery vehicles. Being biosynthetic and protein-based, our design also paves the way for developing viruses that are completely artificial and yet can replicate in a cellular host.



WED. APRIL 30th, 2014 • ROOM **56-114**

SEMINAR 3:30 - 5:00 PM • REFRESHMENTS 3:00 PM

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