

Virus-Based Assemblies as Nanocontainers and Nanoreactors

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The Cowpea Chlorotic Mottle Virus (CCMV) is a plant virus (28 nm in diameter) whose protein shell defines an inner cavity of approximately 18 nm. One of the interesting features of this virus is its sensitivity to pH and ionic strength. Depending on these factors, CCMV capsids can rapidly be disassembled *in vitro* into protein dimmers and then re-assembled again. In this lecture, new concepts related to the use of CCMV capsids as nanoreactors will be presented (Figure 1).¹ The following topics will be discussed: (i) the encapsulation of DNA-templated chromophore assemblies within virus protein nanotubes;² (ii) the controlled integration of synthetic polymers within the CCMV cavity;³ (iii) the use of the CCMV capsid as a nanoreaction vessel for the controlled free radical polymerization of water soluble monomers; and (iv) the templated synthesis of well-defined inorganic nanoparticles inside CCMV.⁴

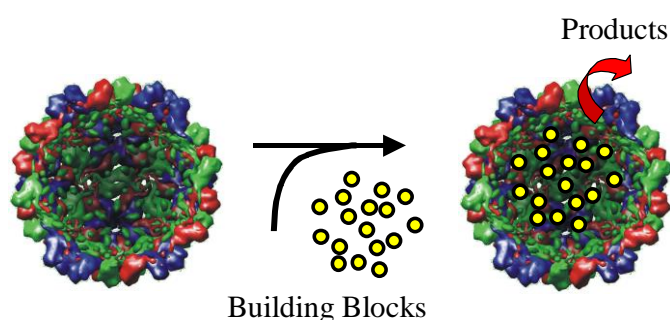


Figure 1. Schematic illustration of the use of viral capsids as nanoreactors

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