TMV-LIKE SELF-ASSEMBLY OF POLY (*para*-ARYLTRIAZOLE) FOLDAMERS

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ABSTRACT

Dynamic equilibrium conditions in biological self-assembly lead to efficient information transfer and self-regulation.[1,2] Important lessons are drawn from the self-assembly of viruses, in particular the tobacco mosaic virus (TMV). TMV is a rod shaped virus, 300 nm long, comprising thousands of identical protein coats wrapped around a single RNA strand.[3] A fully infective TMV can be re-assembled from the dissociated subunits.[3] Inspired by TMV, scientists have utilized the concepts template length control and the use of structural subunits programmed with information on the final architectural plan.[4] Implementing equilibrium self-assembly to create large finite hierarchical nanostructures remains a significant challenge. In this work, the hierarchical self-assembly of a helical poly(*para*-aryltriazole) foldamers is detailed. The solvophobic folding process yields helical discs that further self-assemble into long and hollow tubular nanostructures. In analogy to the TMV, a polymer template presented to the foldamer at its coil-to-helix transition mid-point is able to precisely regulate both the length and the chirality of the self-assembled construct. The observed mechanisms and structures formed mimic closely the hierarchical assembly processes of TMV

References:

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