

Defined Protein-Based Supramolecular Nano-Architectures

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The molecular assembly of complex and functional supramolecular architectures, spanning the range of several dozen to several 100 nm, still poses many unsolved questions, most importantly, how to create them.

Nature accomplished such tasks by a complex interplay of protein structures via hydrogen bonds, electrostatic and hydrophobic interactions and static and dynamic covalent bonds. Examples can be found manifold, e.g. in fibril forming proteins, or in a more complex scheme, in the supramolecular assembly of multisubunit protein complexes where position as well as dynamic behaviour is under control. We are employing this strategy to derive complex and multifunctional protein building blocks in order to synthesize and assemble newly designed 2 and 3D nano-architectures for a vast variety of functional applications in material science and nanobiotechnology.