

Preparation of Functional Nanomaterials through Biomimetic Self-Assembled Molecules

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Recently, various inorganic and carbon-based nanomaterials, such as nanocrystals and nanotubes have been used as building blocks to assemble nanometer-scale devices because this molecule has both organic and biological properties simultaneously. We synthesized a biomimetic bolaamphiphile molecule of bis(N- α -amido-glycylglycine)-1,7-heptane dicarboxylate and applied for the preparation of inorganic nanotubes and nanoparticles. Due to the bolaamphiphilicity of this molecule, it would self-assemble to form tubular or ring-shaped peptide nanostructures can be further organized into nanotubes, nanoparticles via their molecular recognition function. Using these nanostructures inorganic functional nanomaterial syntheses were achieved under milder experimental conditions by the biological catalytic activity. These features of peptide-based nanomaterials are, therefore, the driving force for the investigation and development of multifunctional biomimetic molecule assemblies for biological and non-biological applications.