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Liquid Crystalline Peptide Nanowires

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Bionanofabrication, constructing nanostructures from biological building blocks, is an emerging technology for generating functional devices. A variety of nanomaterials with diverse chemical or biological functionalities have been synthesized by utilizing highly specific biomolecular interactions. However, large-scale organization of those nanostructured biomaterials, which is critical for diverse applications, has rarely been explored yet. Here we demonstrate liquid crystalline peptide nanowires as novel materials for bionanofabrication. The bionanowires individually dispersed in an organic solvent could be readily assembled from an aromatic dipeptide. The stable dispersion of peptide nanowires exhibited colloidal liquid crystalline phase for a broad concentration range, allowing the rapid alignment of peptide nanowires under an external field. Hierarchical organization of liquid crystalline peptide nanowires consisting of highly specific biomolecular assembly and nanoscale liquid crystalline ordering provides an efficient pathway to a novel bionanoarchitecture.

Keywords: self-assembly, colloidal liquid crystal, nanowires

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Synthesis and Characterization of Nano Ag Coated Porous Hydroxyapatite Scaffold

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Firstly, porous hydroxyapatite scaffold (PHS) was fabricated by replica method, where polyurethane foam has filaments coated with a HAp suspension. The PHS was showed excellent interconnected pores and its pore sizes were about 300 −700 μm in diameter. And then, nano-Ag spot-coated PHS was successfully synthesized by the electroless deposition process. The results showed that nano-Ag spots were homogeneously dispersed on the PHS. In this work, nano-Ag was used as antibacterial effect to prevent infections. To evaluate biocompatibility of the nano-Ag spot-coated PHS composites, in-vitro study were carried-out using human MG-63 osteoblass cells.

Keywords: HAp, scaffold, coating, in-vitro study