Electronic Supplementary Information (ESI)

Bone-Like Peptide/Hydroxyapatite Nanocomposites Assembled with Multi-Level Hierarchical Structures

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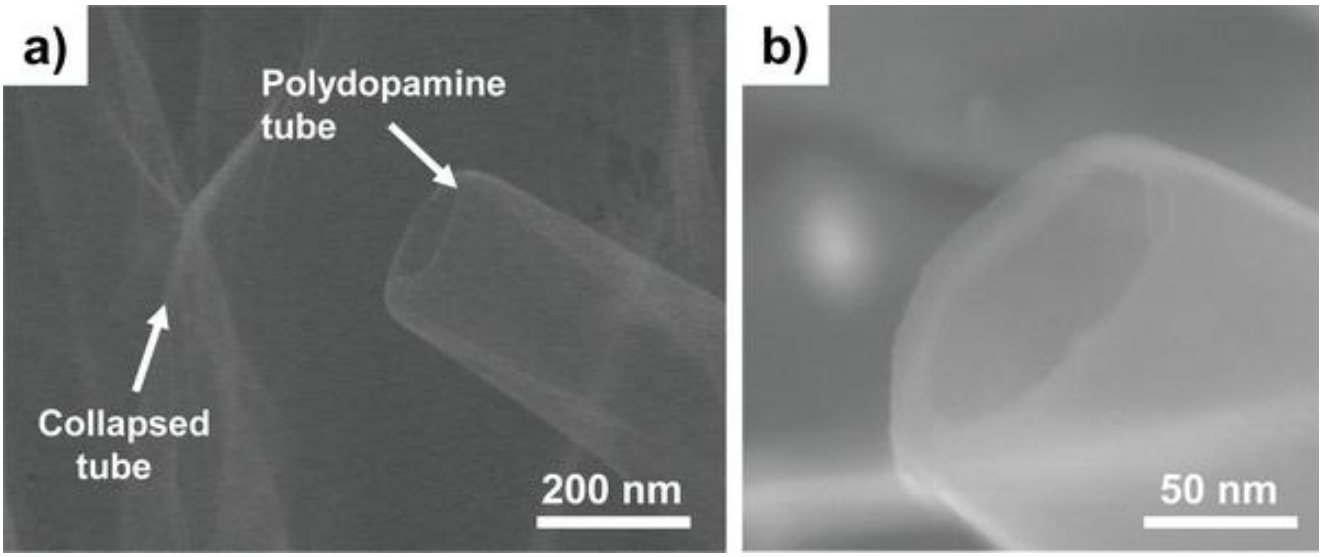

Figure S1. SEM micrographs of polydopamine nanotubes demonstrating the preferential growth of polydopamine along the side wall of peptide nanowires. Peptide nanowires were coated with polydopamine by incubating in a 2 mg mL^{-1} dopamine solution for 16 h. Polydopamine-coated peptide nanowires were then annealed at 300 ˚C to selectively remove the peptide nanowires. By measuring the wall-thickness of polydopamine nanotubes, we could also indirectly estimate the thickness of polydopamine layer grown along the peptide nanowires.

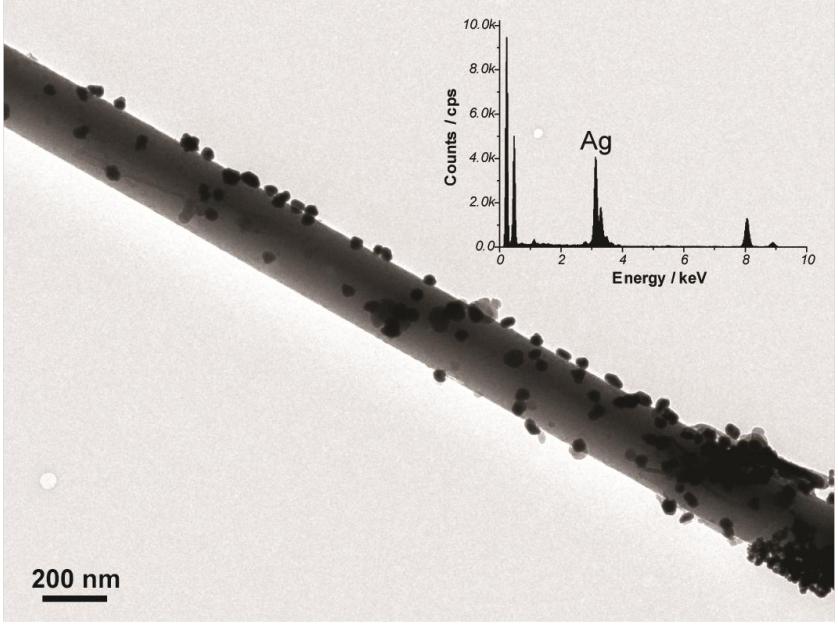

Figure S2. A TEM image and EDS spectrum of polydopamine-coated peptide nanowires after incubation in 0.1 M $AgNO_3$ solution for 2 h. Because of the reducing power of polydopamine (Y. Fu et al., *Adv. Funct. Mater.* **2009**, *19*, 1784-1791), Ag nanoparticles formed along the polydopamine-coated peptide nanowires even without reducing agents.

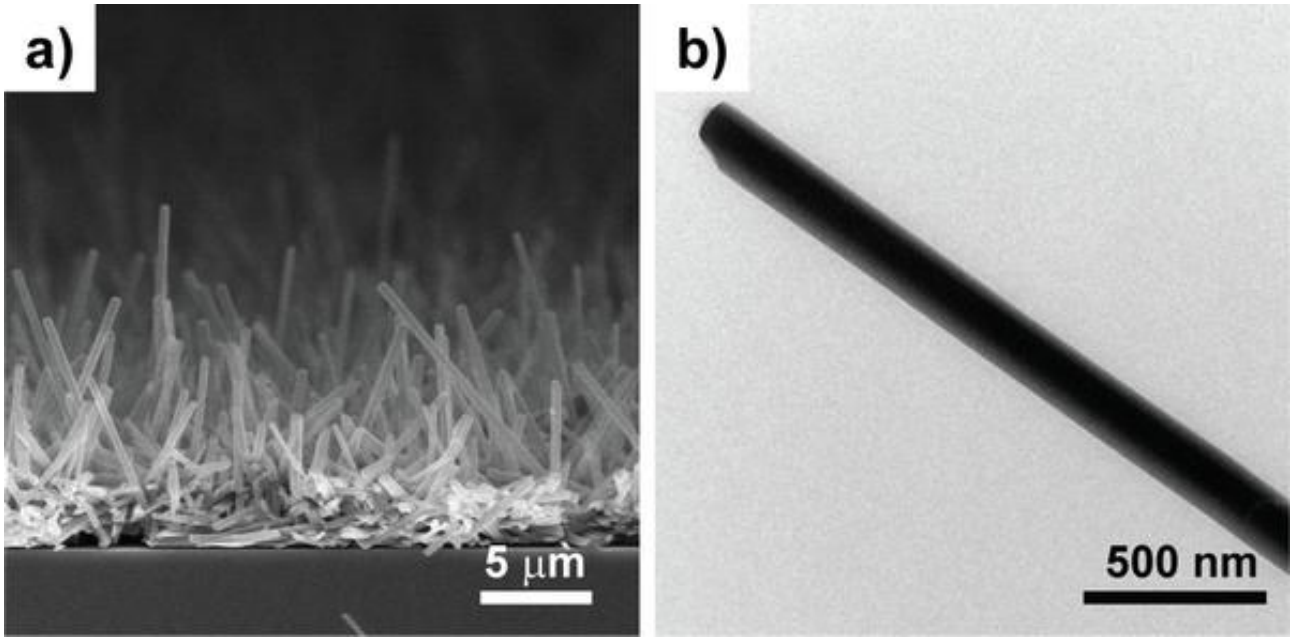

Figure S3. SEM (a) and TEM (b) micrographs of peptide nanowires after incubation in 1.5× SBF at 37 ^{o}C for a week. It was found that pristine peptide nanowires (without polydopamine coating) have no biomineralization activity.

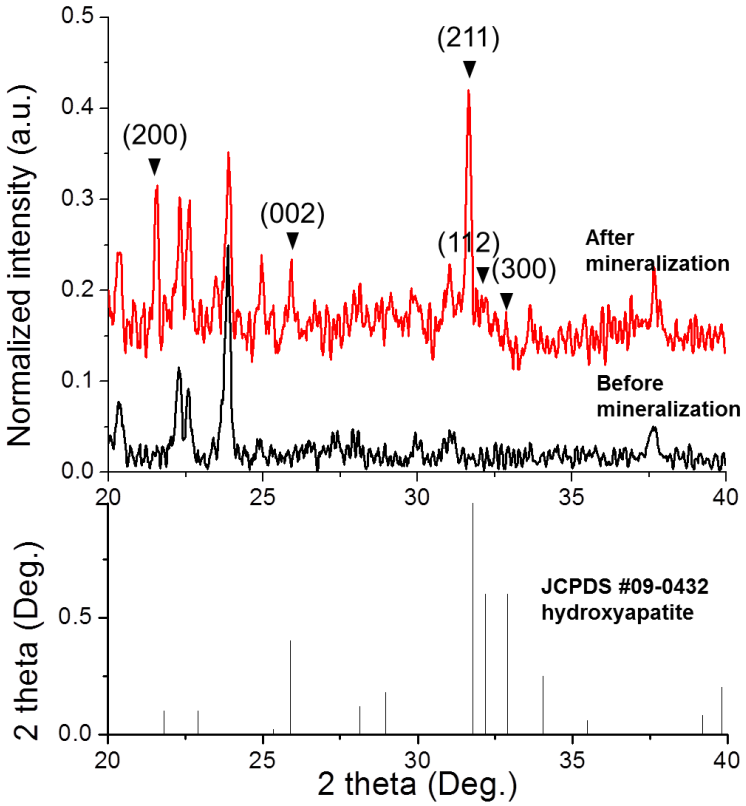

Figure S4. XRD diffraction patterns of polydopamine-coated peptide nanowires before and after two days of biomineralization in 1.5× SBF at 37 ˚C. It was found that calcium phosphate minerals grown along the polydopamine-coated peptide nanowires are hydroxyapatite, rather than other calcium phosphate crystals such as octacalcium phosphate and dicalcium phosphate.

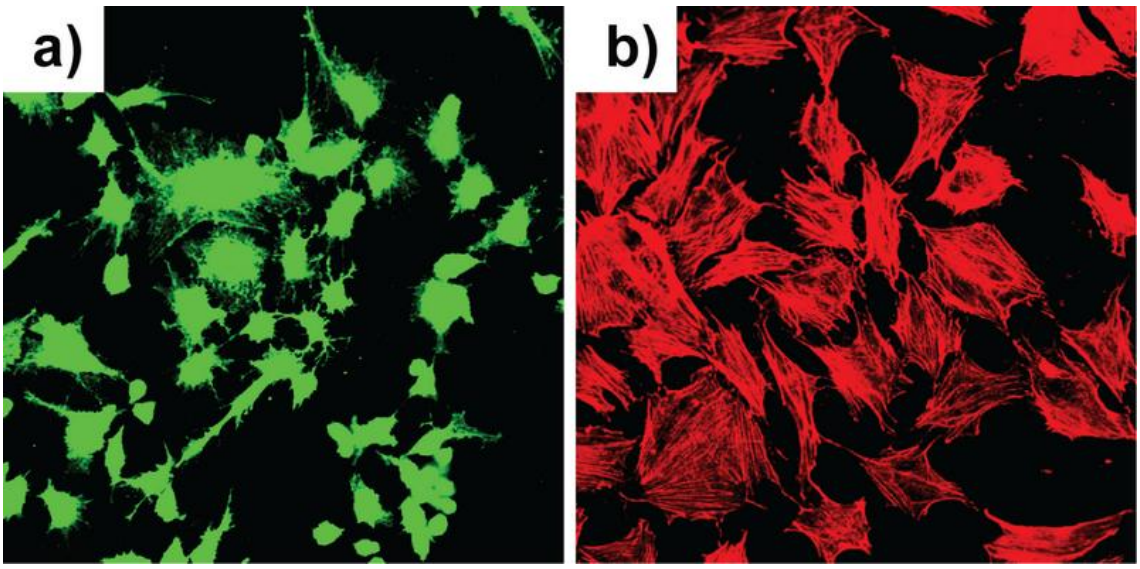

Figure S5. Fluorescent micrographs of preosteoblast (MC3T3-E) cultured on glass substrate showing polygonal morphology. (a) Live/Dead cell assay; (b) actin-filament staining with rhodamine-phalloidin.