Supporting Information:

Self-assembly and mineralization of genetically modifiable biological nanofibers driven by beta-structure formation

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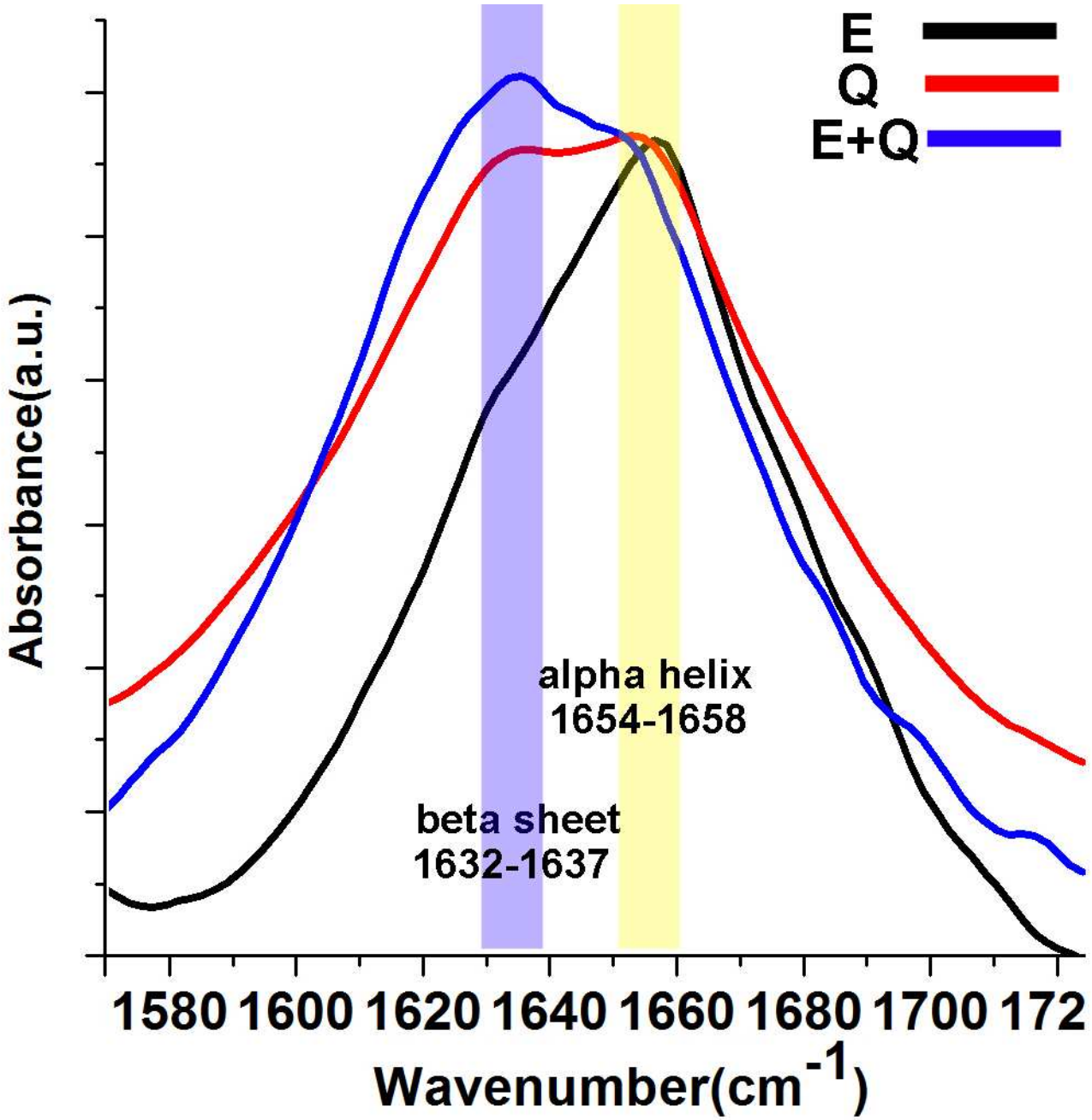

Figure S1: FT-IR spectra of phage E, Q, and E+Q. The spectrum of E phage shows essentially a band corresponding to alpha helix with a maxima around 1655 cm^{-1}. However, the spectrum of Q phage shows an obvious shoulder band corresponding to beta sheet with a maxima around 1634 cm^{-1}. This shoulder band is further increased for E+Q phage, suggesting that E+Q phage contains most beta sheet structure content.

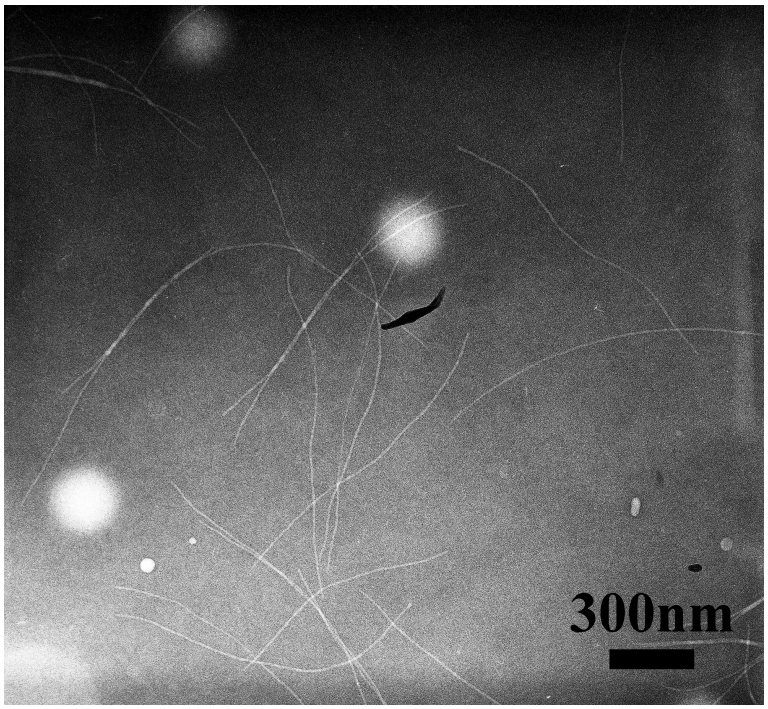

Figure S2: The result of the nucleation test on wild-type phages. The sample was negatively stained with 1% PTA. Without staining, the wild-type phages are not visible because no minerals are formed on the surface of phages. In this control experiment, 20 μl of 0.2 mg/ml wild type phage suspension was mixed with 1ml supersaturated HAP solution in vials. Therefore, the final concentrations of wild type M13 phage and calcium ions are about 1.43×10^{11} pfu/ml and 4mM, respectively. [Note: In our earlier work, we reported that M13 phage particles could form bundle structures in the presence of very high concentration of calcium ions and the phage-Ca^{2+} bundle composites could induce the formation of amorphous HAP minerals on them. The experimental conditions and procedures used in that work are totally different from those in this work. In that work, we used a higher concentration (2×10^{11} pfu/ml) of wild type M13 phage particles, which were soaked into the solution with a very high concentration of calcium ions (200 mM, which is much higher than 4 mM used in this study). (Wang, F. K.; Cao, B. R.; Mao, C. B., Bacteriophage Bundles with Prealigned Ca^{2+} Initiate the Oriented Nucleation and Growth of Hydroxylapatite. *Chem Mater* **2010,** *22* (12), 3630-3636.)]