Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supplementary data

MBP
MKIEEGKLVI WINGDKGYNG LAEVGKKFEK DTGIKVTVEH PDKLEEKFPQ VAATGDGPDI 60

IFWAHDRFGG YAQSGLLAEI TPDKAFQDKL YPFTWDAVRY NGKLIAYPIA VEALSLIYNK 120

DLLPNPPKTW EEIPALDKEL KAKGKSALMF NLQEPYFTWP LIAADGGYAF KYENGKYDIK 180

DVGVDNAGAK AGLTFLVDLI KNKHMNADTD YSIAEAAFNK GETAMTINGP WAWSNIDTSK 240

VNYGVTVLPT FKGQPSKPFV GVLSAGINAA SPNKELAKEF LENYLLTDEG LEAVNKDKPL 300

GAVALKSYEE ELVKDPRIAA TMENAQKGEI MPNIPQMSAF WYAVRTAVIN AASGRQTVDE 360

BSP

ALKDAQTNSS SNNNNNNNNN NLGIEGRISE FNGVFKYRPR YYLYKHAYFY PHLKRFPVQG 420

HAP

SSDSSEENGD DSSEEEEEEE ETSNEGENNE EDSNEDEDGG GSGGCMLPHH GAC 473

Fig. S1. The amino acid sequence of recombinant protein (MBP)-BSP-HAP. Amino acid sequences of maltose binding protein (MBP), bone sialoprotein (BSP), and hydroxyapatite binding peptide (HAP) are highlighted with red, blue, and purple. Linking sequences are underlined.

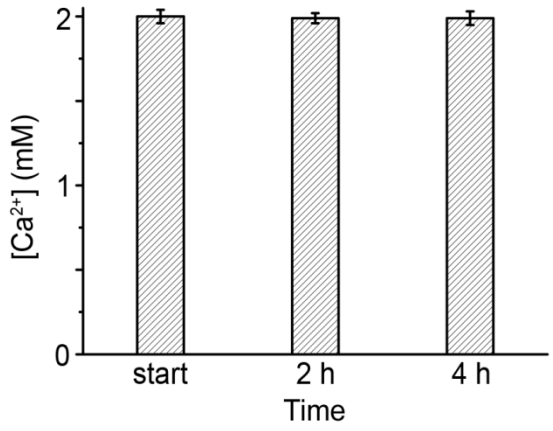

Fig. S2. Changes of calcium ion concentration after calcium ions were absorbed by amylose resin.

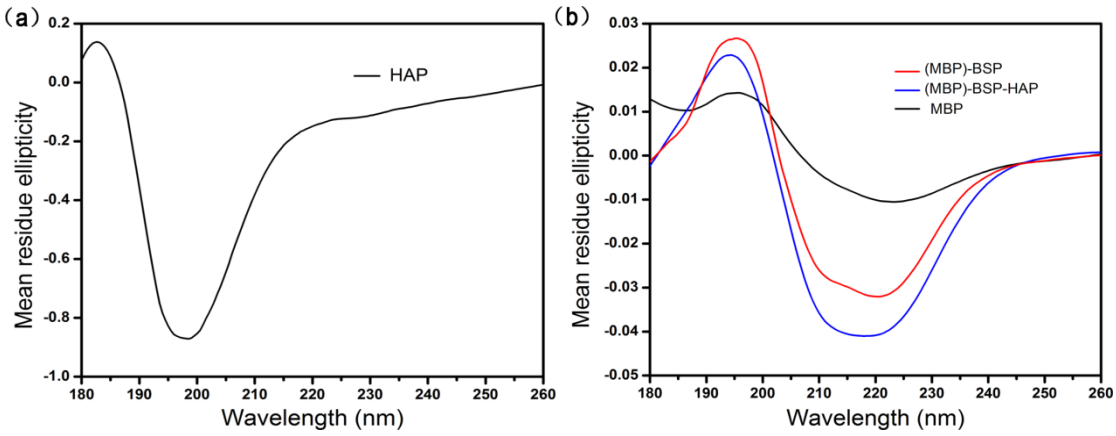

Fig. S3 CD spectra of purified MBP, (MBP)-BSP, (MBP)-BSP-HAP, and HAP. CD measurement was based on reference 37 in an AVIV 60 CD spectrometer using 1 nm bandwidth and a scanning rate of 20nm min^{-1}.

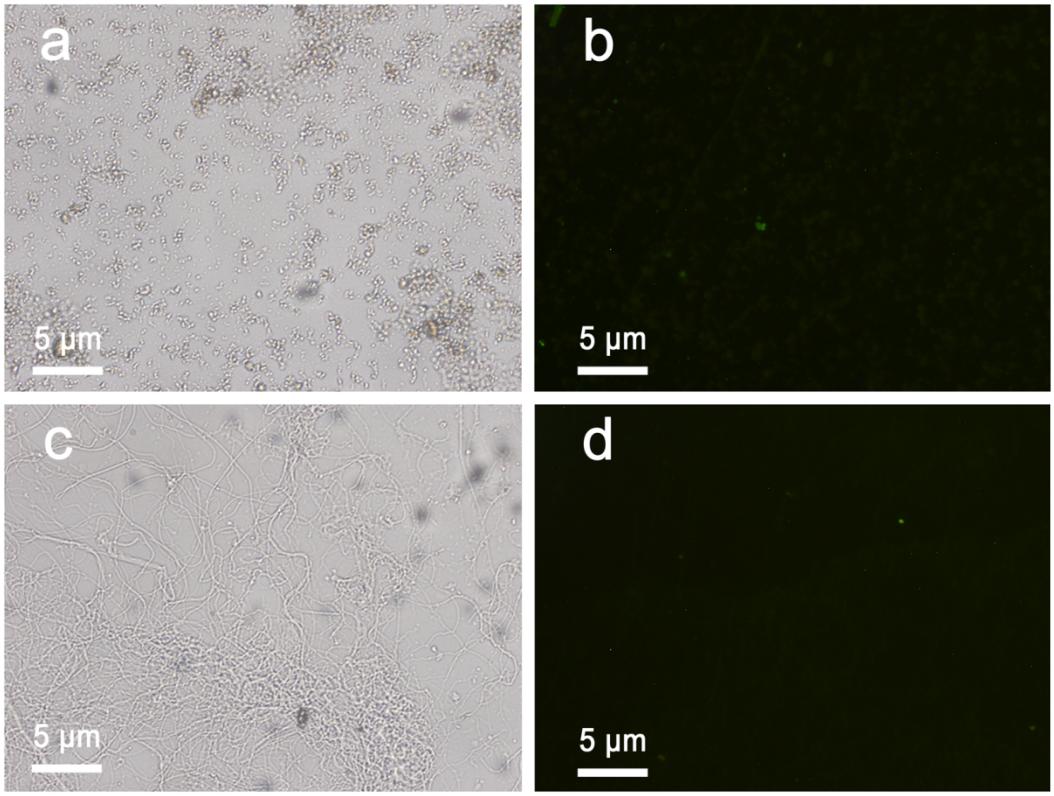

Fig. S4. The ability of binding hydroxyapatite powder and collagen fibrils of 1 mg ml^{-1} MBP. (a) and (c) show bright field microscopy images of hydroxyapatite powder and collagen fibrils incubated with 1FITC-labeled MBP; (b) and (d) show fluorescence microscopy images of hydroxyapatite powder and collagen fibrils incubated with FITC-labeled MBP.

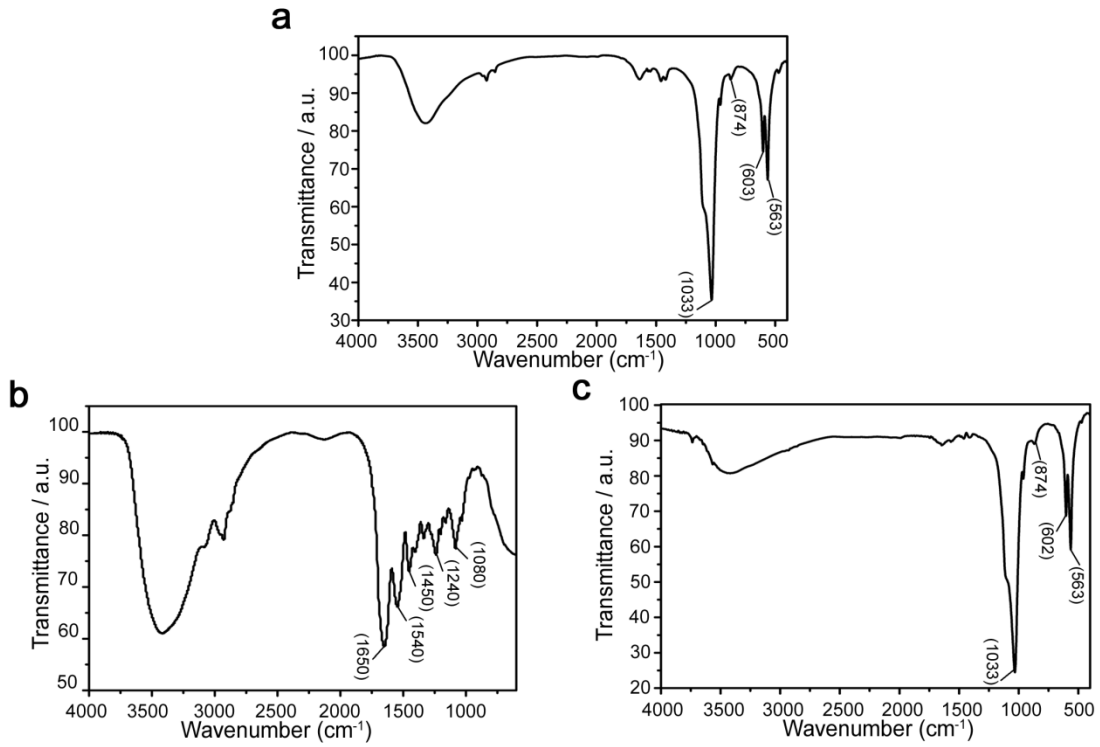

Fig. S5. FTIR spectra of (a) mineralized collagen fibrils without any additive, (b) commercially available type I collagen, and (c) commercially available hydroxyapatite powder.

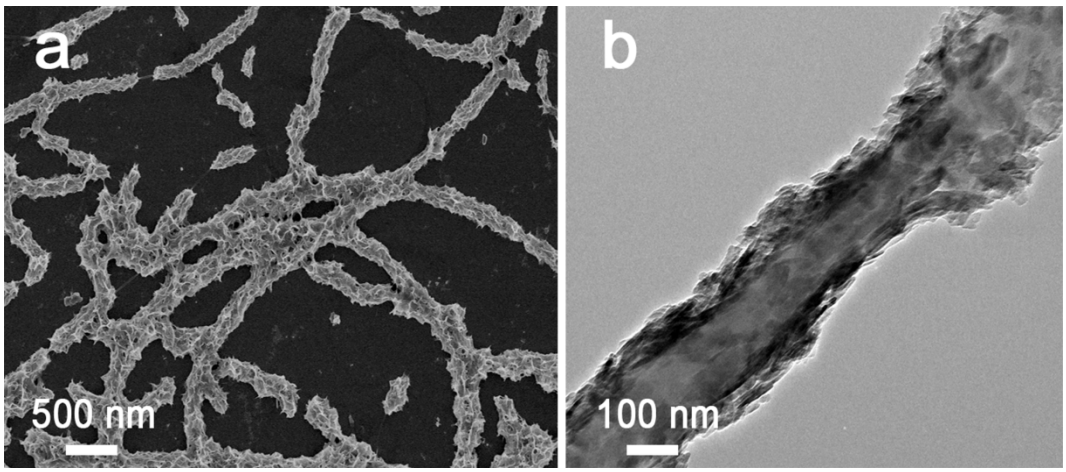

Fig. S6 Electron microscopy images of mineralized collagen fibrils in the presence of 2 μg ml^{-1} (MBP)-BSP-HAP. (a) SEM image of mineralized collagen fibrils. (b) TEM image of an isolated collagen fibril.

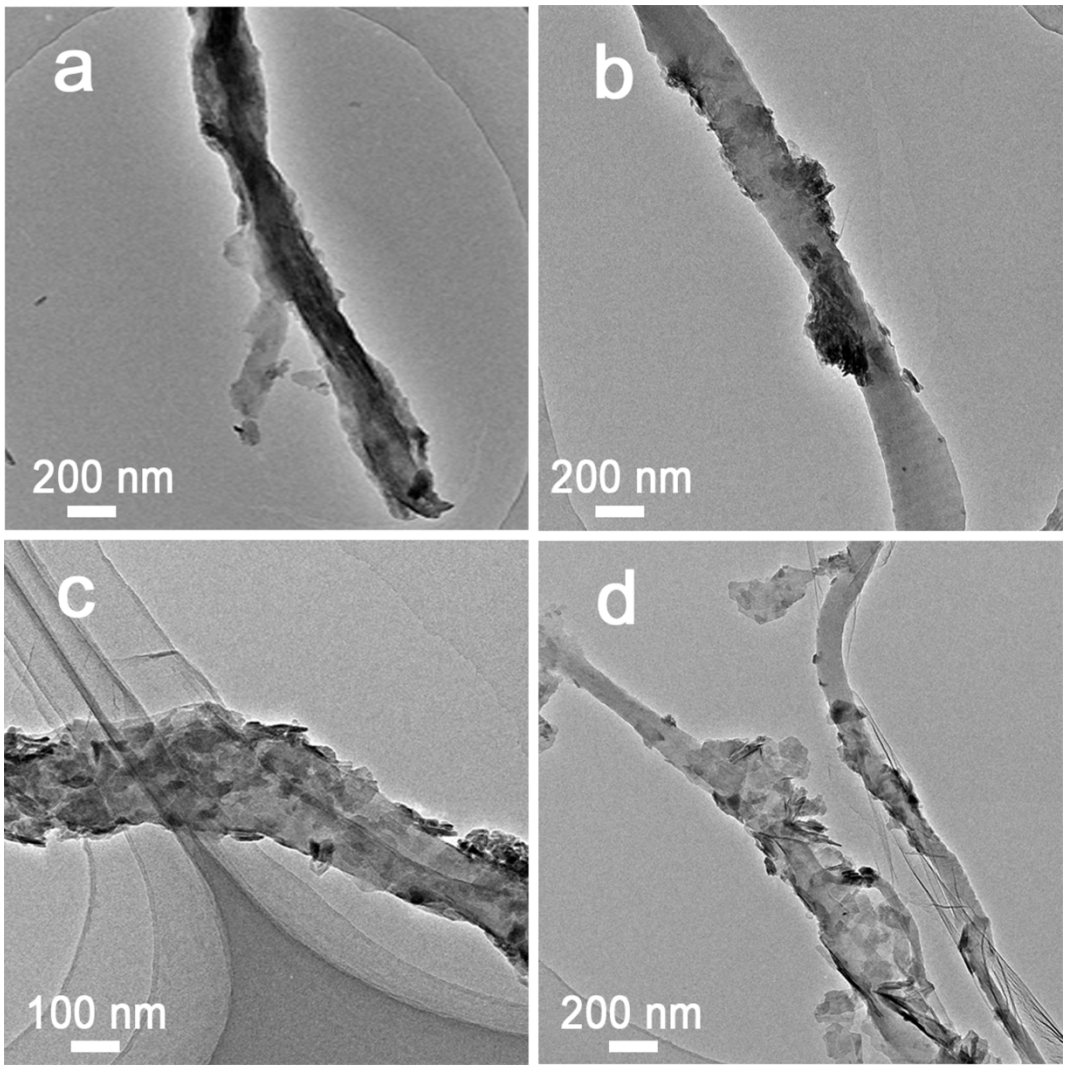

Fig. S7 TEM images of mineralized collagen fibrils in the presence of 2 μg ml^{-1} different fragment of (MBP)-BSP-HAP. (a) HAP, (b) MBP, (c) (MBP)-BSP, (d) (MBP)-BSP mixing with free HAP.

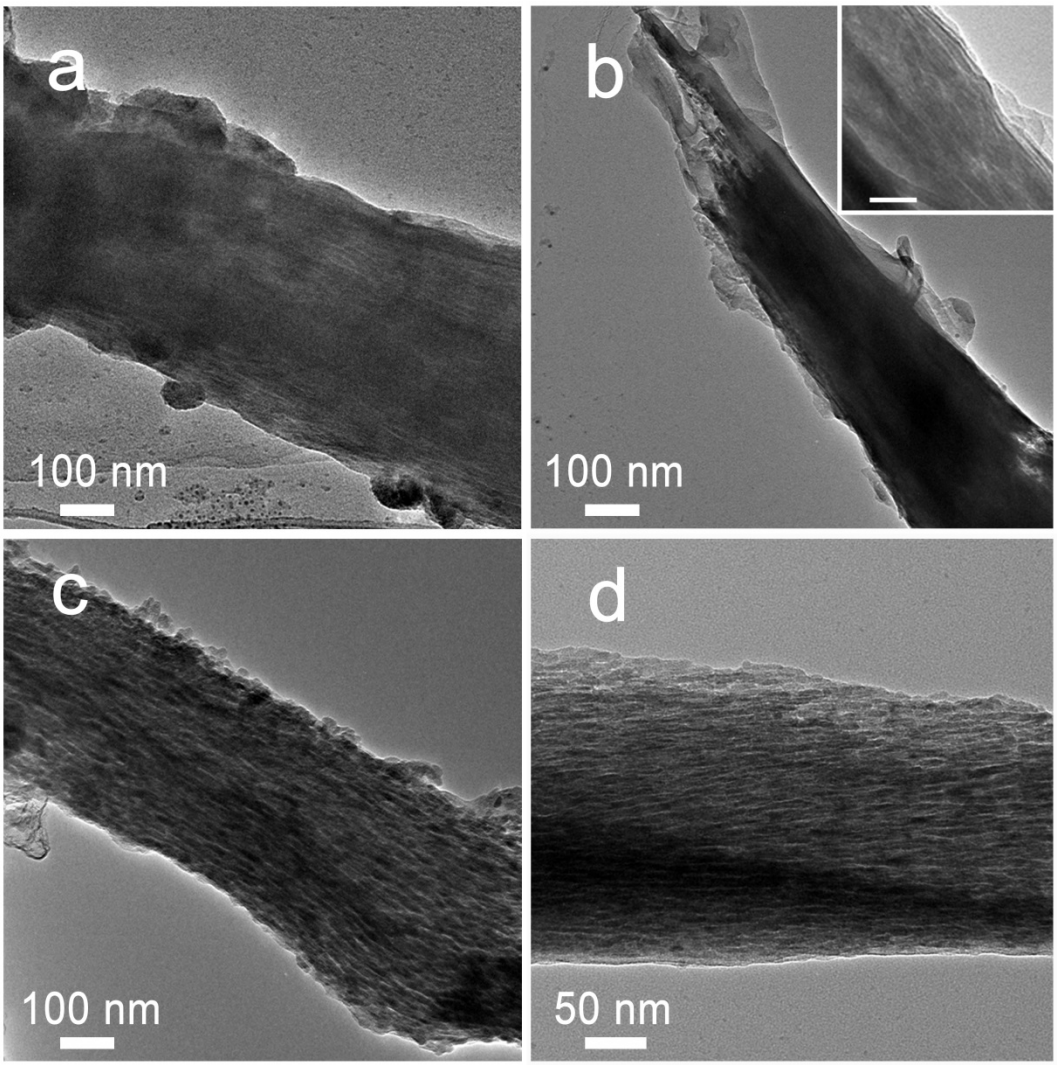

Fig. S8 TEM images of mineralized collagen fibrils in the presence of 100 μg ml^{-1} polyacrylic acid (PAA) and 2 μg ml^{-1} different fragment of (MBP)-BSP-HAP. (a) PAA mixing with HAP, (b) PAA mixing with MBP (scale bar in inset is 50 nm), (c) PAA mixing with (MBP)-BSP, (d) PAA mixing with (MBP)-BSP and free HAP.