Supporting Information

Increasing enzyme-like activity by in situ anchoring of Ag_3PO_4 nanoparticles on keratin-inorganic hybrids nanoflower

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Preparation of keratin

Feather was thoroughly washed with water by Soxhlet extraction, then degreased with acetone and subsequently regenerated keratin was prepared by reduction extraction. Keratin solution was prepared by immersing 10 g defatted feather into 100 mL solution containing 8 M urea, 0.2 M SDS and 0.5 M $Na_2S_2O_5$. The mixture was heated to 70°C for 60 min. Then the solution was filtered, and the dialysis was carried out using cellulose tubes with molecular weight cut-off values of 8000-14000 Da. The keratin solution was lyophilized into powder for further experiments.

SEM of Ag_3PO_4

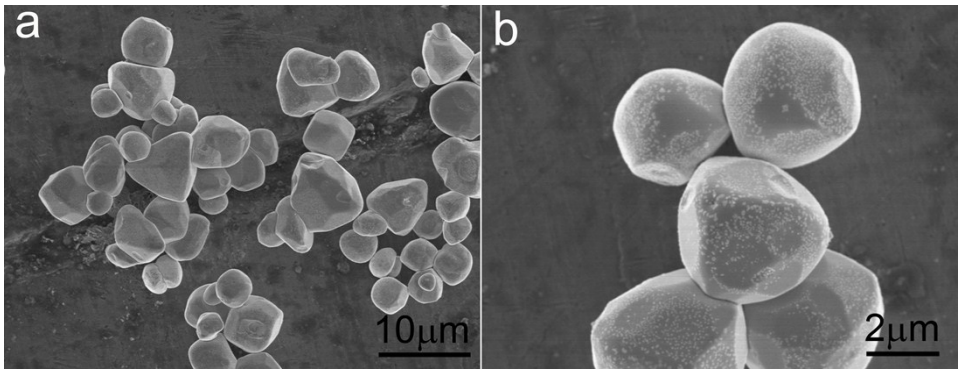

Fig.S1 (a, b) SEM images of Ag_3PO_4

SEM of keratin-NF@Ag_3PO_4(1:5)

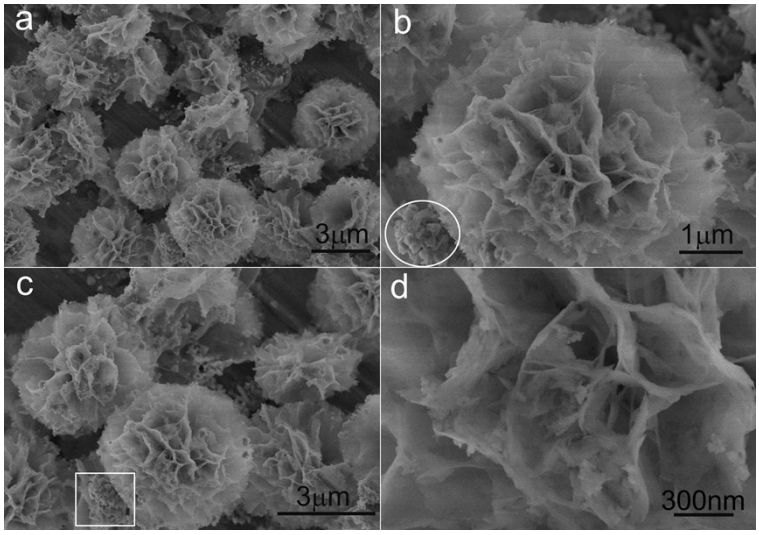

Fig.S2 (a, b, c, d) SEM images of the keratin-NF@Ag_3PO_4(1:5)

EDX spectrum of keratin-NF@Ag_3PO_4

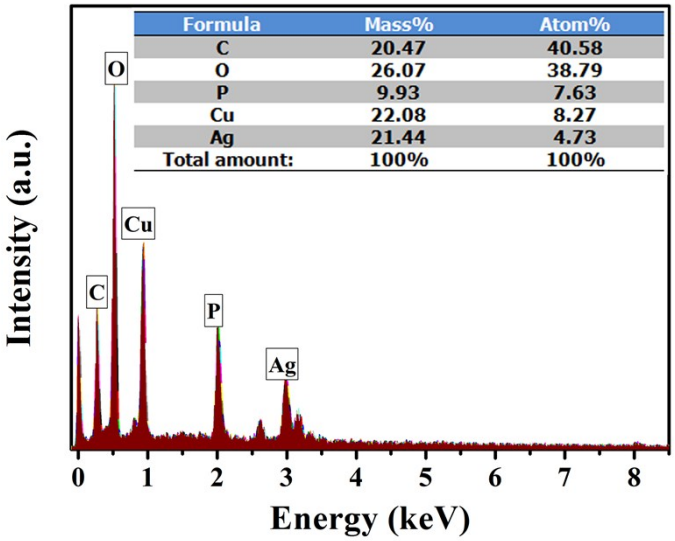

Fig.S3 EDX spectrum of the synthesized keratin-NF@Ag_3PO_4.

FT-IR spectra of the obtained nanoflower

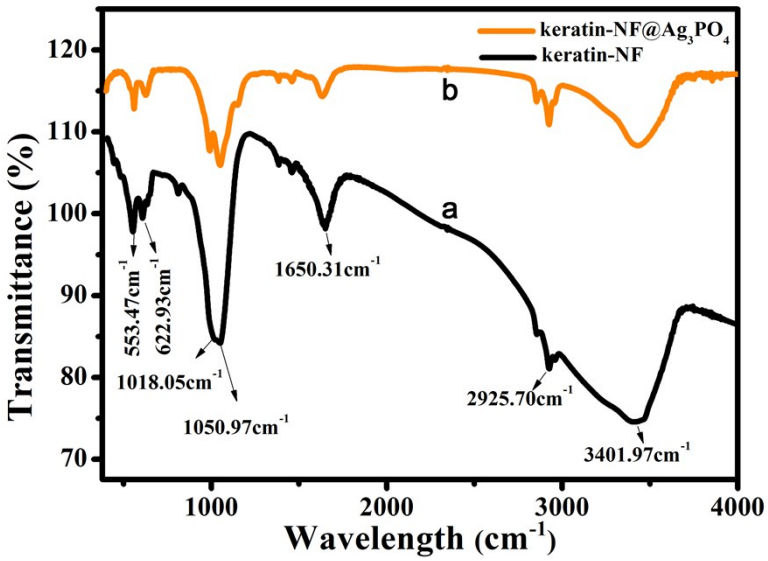

Fig.S4 FT-IR spectra of as-prepared nanoflower. (a) keratin-NF, (b) keratin-NF@Ag_3PO_4

XRD patterns of the as-prepared samples

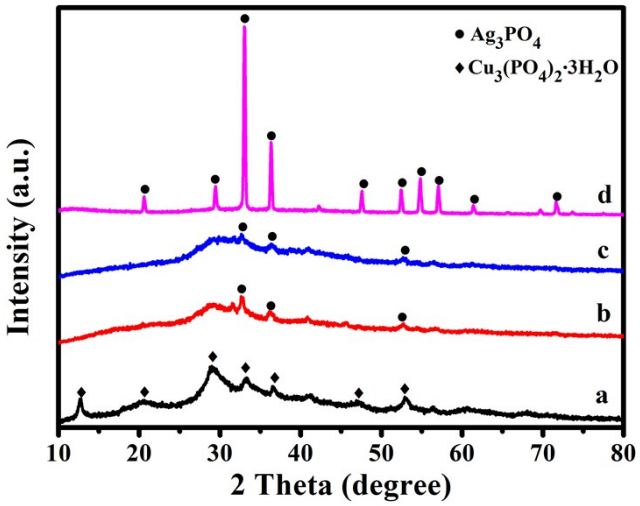

Fig.S5 XRD patterns of the as-prepared samples. (a)$Cu_3(PO_4)_2$; (b)$Cu_3(PO_4)_2$@Ag_3PO_4(1:3); (c) keratin-NF@Ag_3PO_4(1:3); (d) Ag_3PO_4.

SEM images of the hybrid nanoflower@Ag_3PO_4

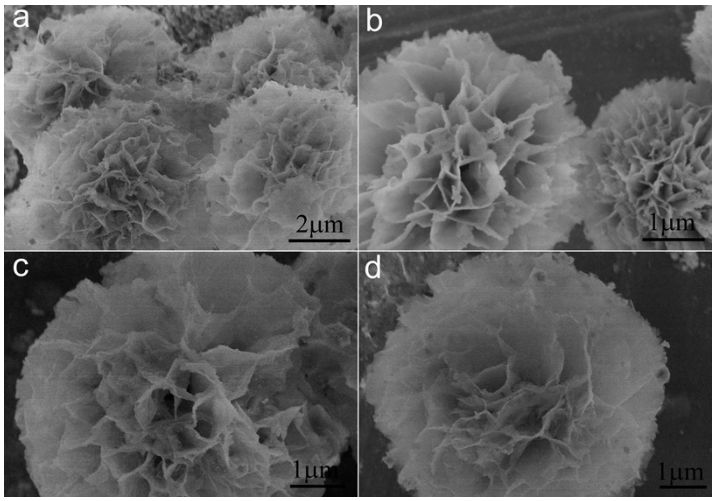

Fig.S6 SEM images of the protein-NF@Ag_3PO_4 (1:3). (a) lysozyme-NF@Ag_3PO_4, (b)BSA-NF@Ag_3PO_4; (c)laccase-NF@Ag_3PO_4; (d)trypsin-NF@ Ag_3PO_4.