Electronic Supplementary Material (ESI) for Soft Matter.

Supporting Information

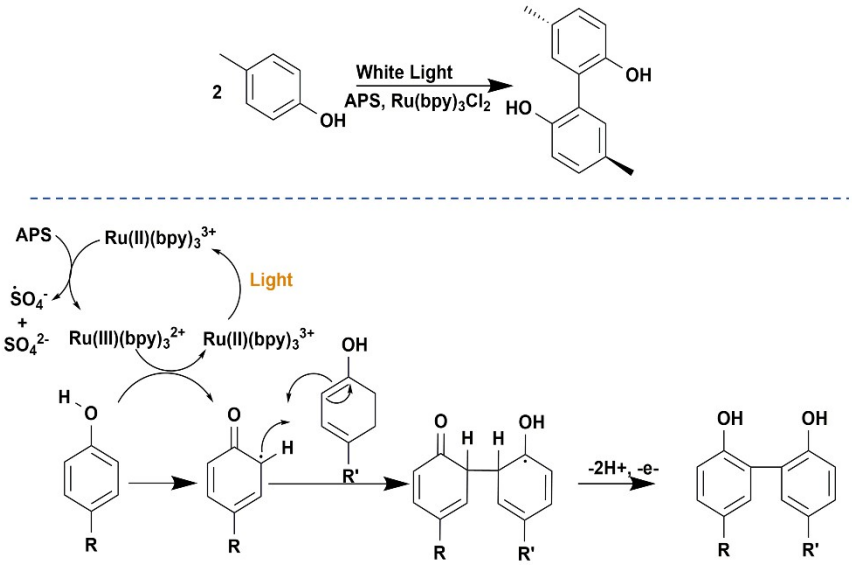

Fig. S1 Ru-mediated photo-crosslinking of tyrosines triggered by white light. White light activates $[Ru(bpy)_3]^{2+}$ in the presence of the electron acceptor APS. Under the catalysis of $[Ru(bpy)^3]^{2+}$, electron transfer occurs between tyrosine residues, resulting in the loss of two protons. A covalent bond can be formed between the benzene rings on tyrosine residues, by which the YYHYY peptides can be linked to each other to form crosslinked aggregates of CL-YYHYY.

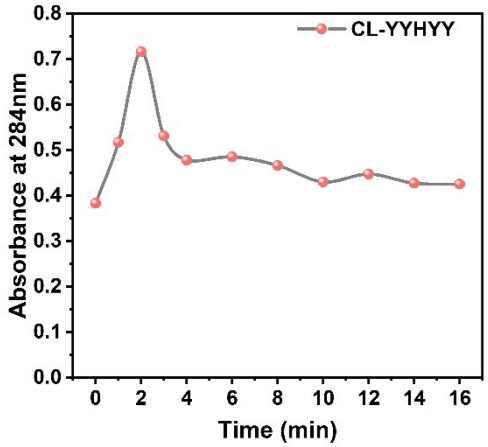

Fig. S2 UV absorption at 284 nm during the preparation of CL-YYHYY.

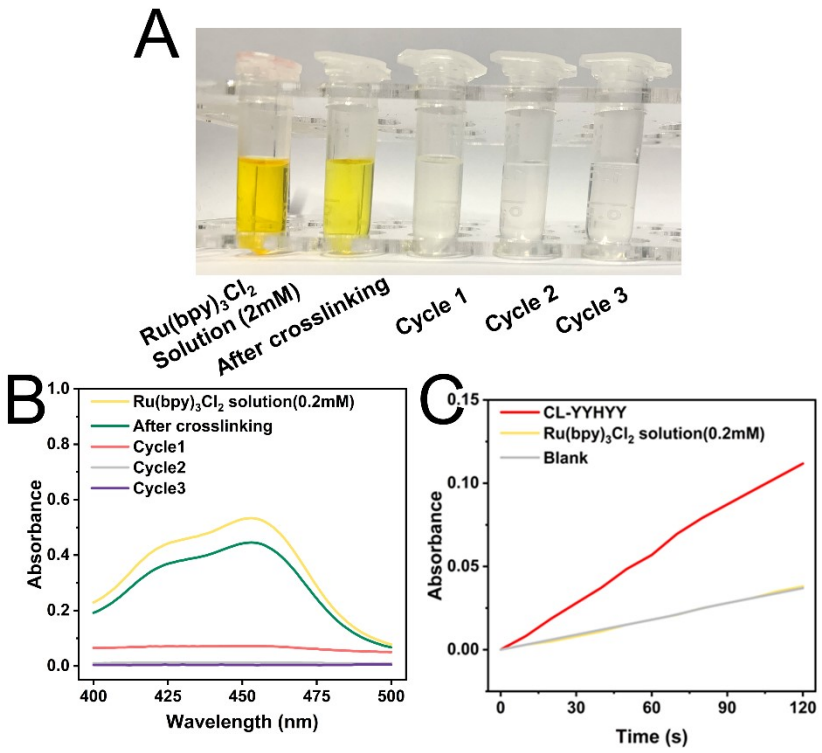

Fig. S3 (A) The photograph of supernatants after crosslinking reaction and each washing cycle during the preparation of CL-YYHYY. (B) UV-vis spectra of supernatants after each washing cycle. (C) Hydrolysis activity analysis of CL-YYHYY and $[Ru(bpy)_3]^{2+}$.

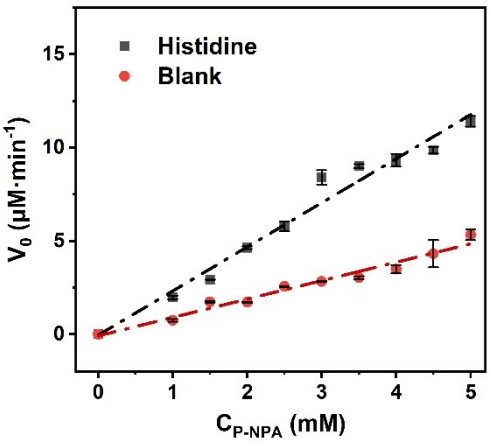

Fig. S4 (A) The kinetic plots corresponding to the hydrolysis rate of free histidine at variable substrate concentrations.

The hydrolysis reaction catalysed by free histidine was proved to follow the first-order reaction kinetics. The apparent second-order rate constant k_2 is obtained by the following eq:

$$k_2 = \frac{k_1 - k_w}{[E_0]}$$

where k_1 is the first-order rate constant determined from the diagram of the initial rates (V_0) under different concentrations of pNPA. k_w is the rate constant of hydrolysis reaction in the absence of catalyst. [E_0] is the concentration of the catalyst.

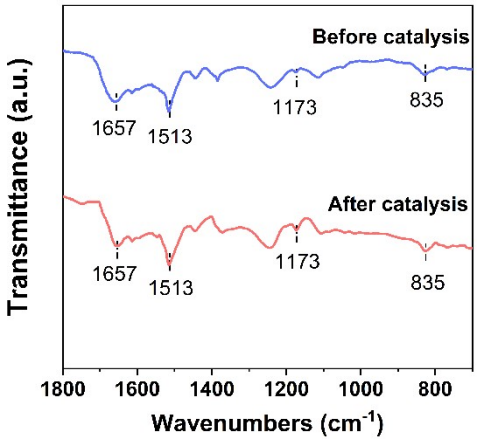

Fig. S5 FTIR spectra of CL-YYHYY before and after the catalytic hydrolysis reaction.