

# **Supporting Information to “Synthesis and Characterization of Tannic Acid-PEG Hydrogel via Mitsunobu Polymerization**

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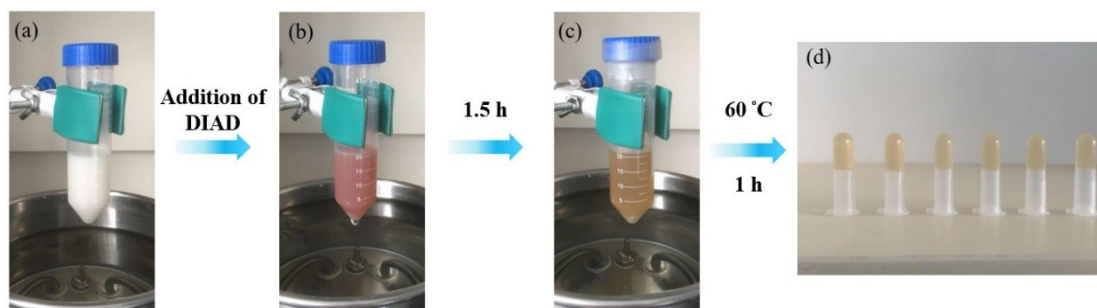
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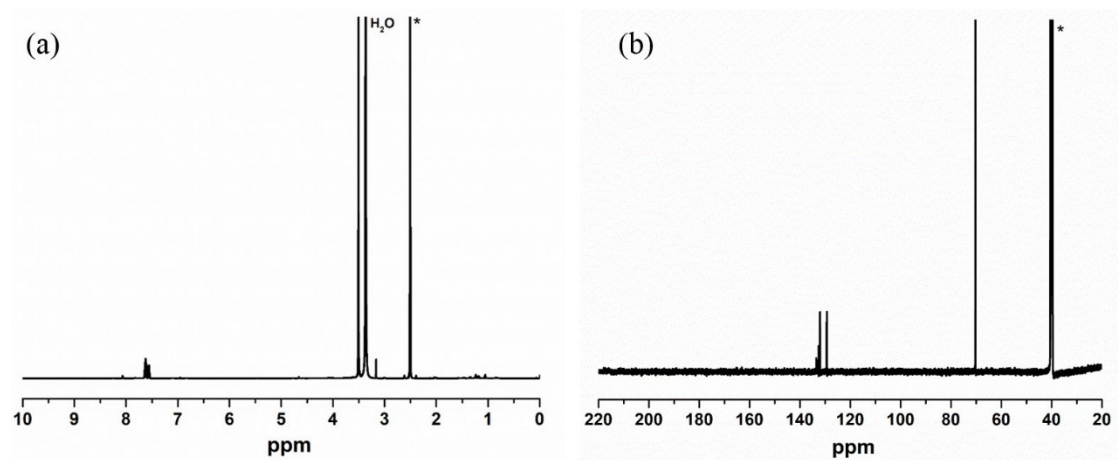
**Table S1** Synthesis of TA-PEG hydrogel: Reagent ratios, ratio of functional groups and results on whether the sample gelled or not.

Sample	TA (mmol)	PEG 6000 (mmol)	Pyrogallol groups/hydroxyl groups	Gelation
TA-PEG	0.100	0.250	1.00	Y
TA-PEG-1	0.100	0.500	0.50	N
TA-PEG-2	0.100	0.125	2.00	N

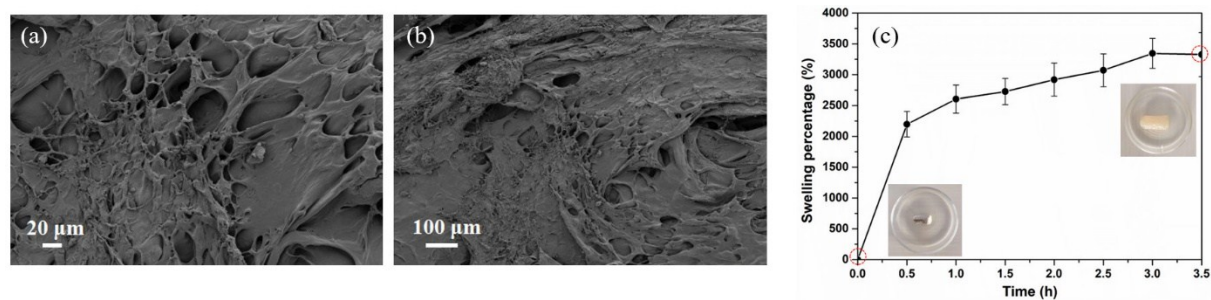


**Figure S1.** The photo pictures of the reaction phenomena for the synthesis of TA-PEG hydrogel. (a) The heterogeneous solution of TA, PEG6000 and  $\text{PPh}_3$  in  $\text{CH}_3\text{CN}$ ; (b) Orange-coloured solution obtained at the end of DIAD titration at

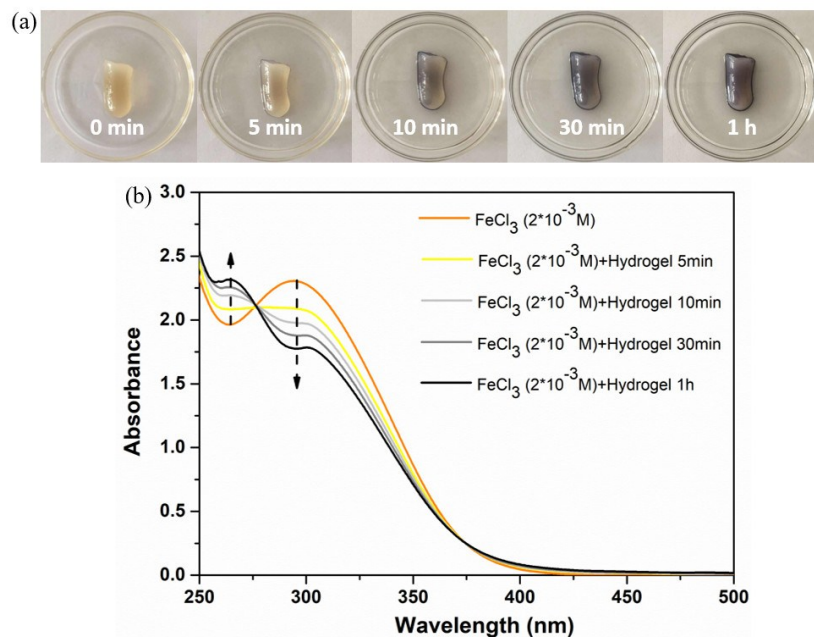
0 °C; (c) The homogeneous solution after constant stirring for 1.5 h; (d) TA-PEG hydrogels.



**Figure S2**  $^1\text{H}$  NMR (a) and  $^{13}\text{C}$  NMR (b) results of the hydrolyzed TA-PEG hydrogel after 10 days in 10 mM PBS (pH 7.4) at 37 °C.



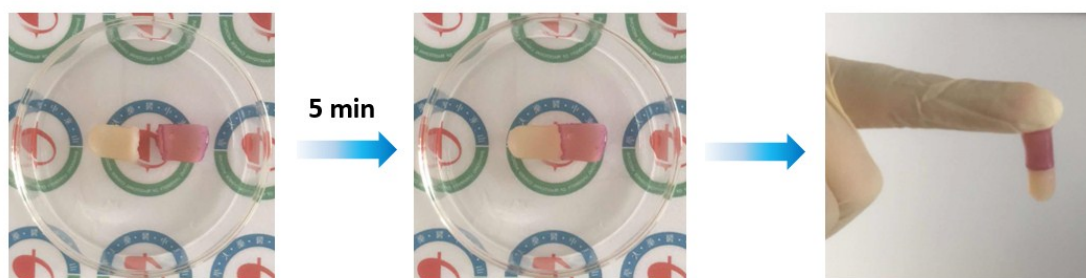
**Figure S3.** Morphology and swelling properties of TA-PEG hydrogel. (a) and (b) Typical FE-SEM micrographs of TA-PEG hydrogel; (c) Swelling percentage of TA-PEG hydrogel.



**Figure S4.** The metal-phenol complexation between Fe<sup>III</sup> iron and TA-PEG hydrogel. (a) Photographs of TA-PEG hydrogel in treatment of FeCl<sub>3</sub> (0.002 M); (b) In-situ formation of metal-phenol complexation observed by UV-vis spectrum.

**Table S2.** Antibacterial activity data of TA-PEG hydrogel against *E. coli* and *S. aureus* (\*P<0.05, #P<0.1).

Sample name	Inhibition zone(mm)	
	<i>E. coli</i>	<i>S. aureus</i>
TA-PEG hydrogel	18.8*	21.7#
Ag NPs@TA-PEG hydrogel	19.2#	20.5#
PVA hydrogel	0	0



**Figure S5.** Adhesive property of TA-PEG hydrogel (only one piece of the hydrogel was stained by *Eosin Y*).

### Supporting Movies

**Movie S1:** In-situ formation of Ag NPs. The TA-PEG hydrogel were cut into pieces (1 cm in diameter and 3mm in height) and the concentration of  $\text{AgNO}_3$  was 0.1 wt%. The movie is real-time.

**Movie S2:** In-situ formation of Au NPs. The TA-PEG hydrogel were cut into pieces (1 cm in diameter and 3mm in height) and the concentration of  $\text{HAuCl}_4$  was 0.01 wt%. The movie is real-time.