

Electronic Supplementary Information

**Gentamicin-thioctic acid multifunctional hydrogel for accelerating infected wound healing**

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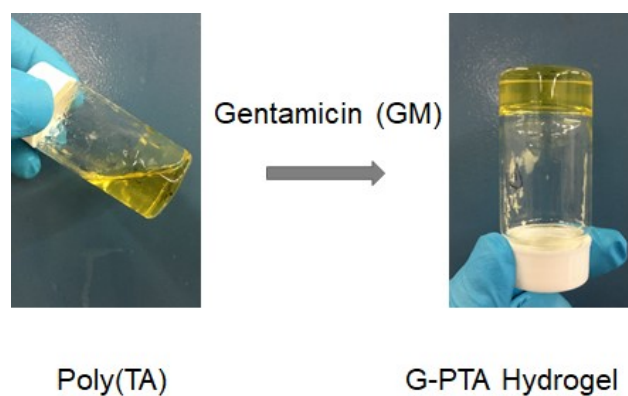
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<sup>#</sup> The authors are equal contribution to this work.

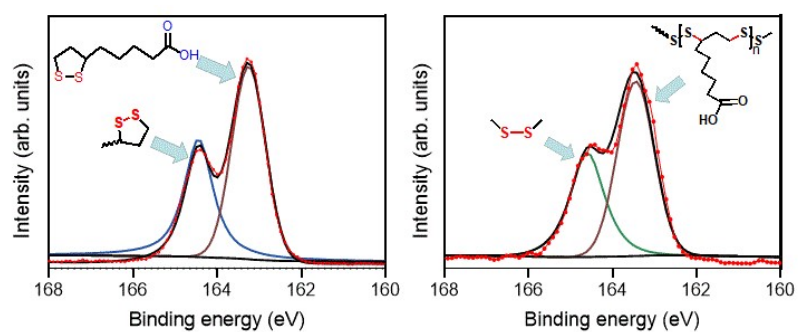
<sup>\*</sup> Corresponding Author.

**Table S1.** Surface elemental composition of TA, PTA, and G-PTA hydrogel.

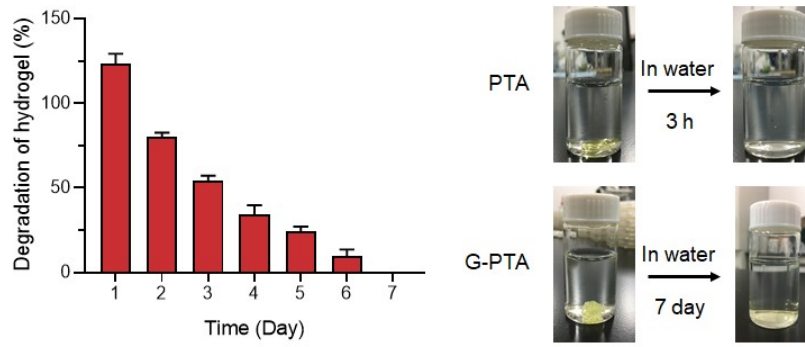
Samples	Atomic Percentages				N/C	O/C
	C1s (%)	N1s (%)	O1s (%)	S2p (%)		
TA	72.9	0	13.9	13.2	0	0.19
PTA	68.3	1.2	17.5	13.0	0.018	0.19
G-PTA	64.4	6.0	24.0	5.6	0.093	0.37



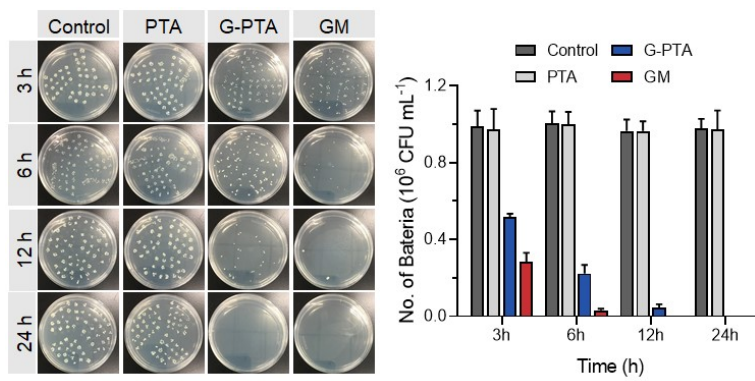
**Fig. S1** Hydrogel morphology changes before and after gentamicin (GM) addition.



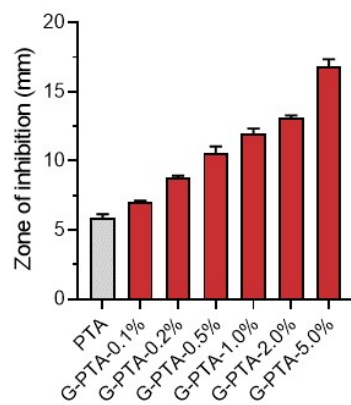
**Fig. S2** The high resolution XPS spectra S2p of TA monomer (left) and PTA supramolecule (right).



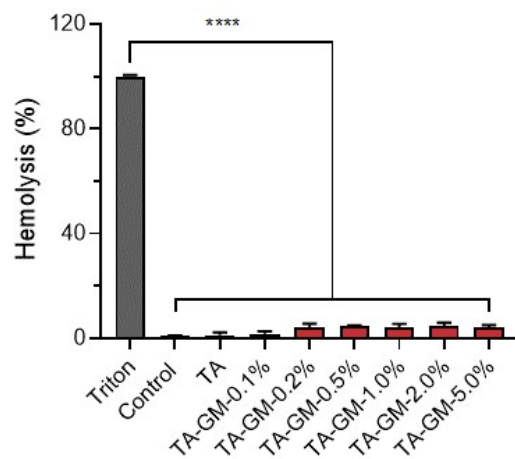
**Fig. S3** Degradation process of G-PTA-10% hydrogel immersed in PBS at 37 °C with varied time.



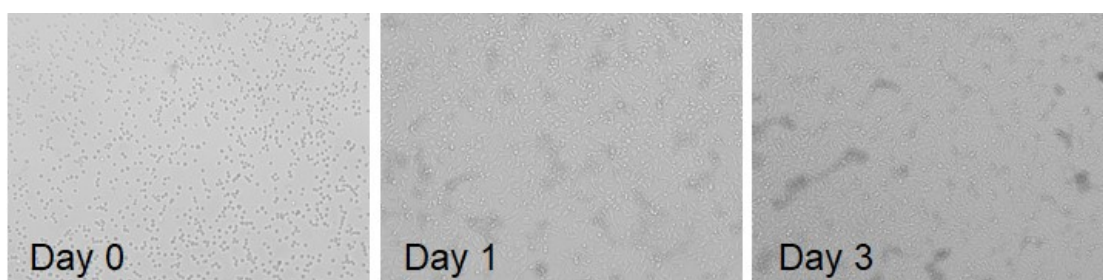
**Fig. S4** Representative images (left) and count (right) of bacterial colonies after co-cultured with hydrogel at 3, 6, 12 and 24 h, respectively.



**Fig. S5** ZOI diameter of the G-PTA hydrogel for *S. aureus* with various GM concentrations.



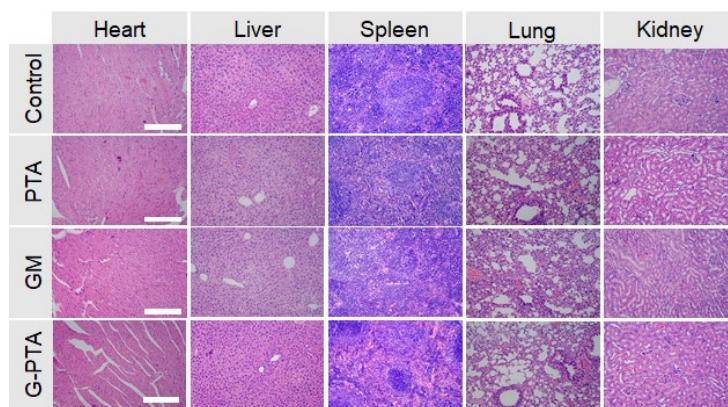
**Fig. S6** Hemolytic activity of G-PTA hydrogel for red blood cell.



**Fig. S7** Proliferation of L929 cells after co-incubation with PTA hydrogel. On the first day, L929 cells grew well but PTA hydrogel was completely degraded until the whole petri dish was covered with cells on the third day.



**Fig. S8** Proliferation of L929 cells after co-incubation with G-PTA hydrogel. Initially, a few cells adhered to the G-PTA hydrogel, followed by rapid adherence and proliferation with time to day3.



**Fig. S9** H&E staining of the main organs (heart, liver, spleen, lung, and kidney) after treatment. Scale bar, 50  $\mu$ m.