Supporting Information

Antibacterial Cascade Catalytic Glutathione-Depleting MOF Nanoreactors

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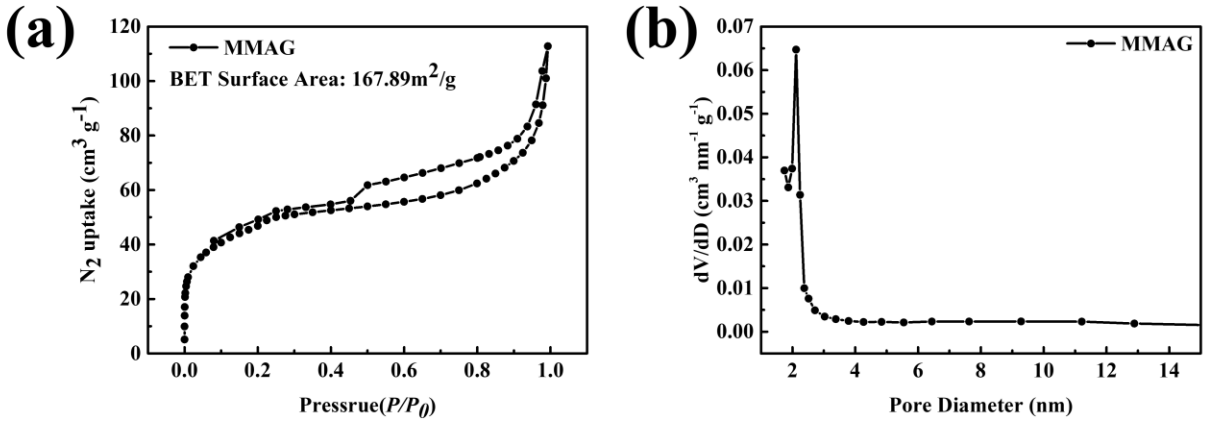

Figure S1. (a) Nitrogen-sorption isotherms and (b) pore distribution of $MnFe_2O_4$@MIL/Au&GOx (MMAG).

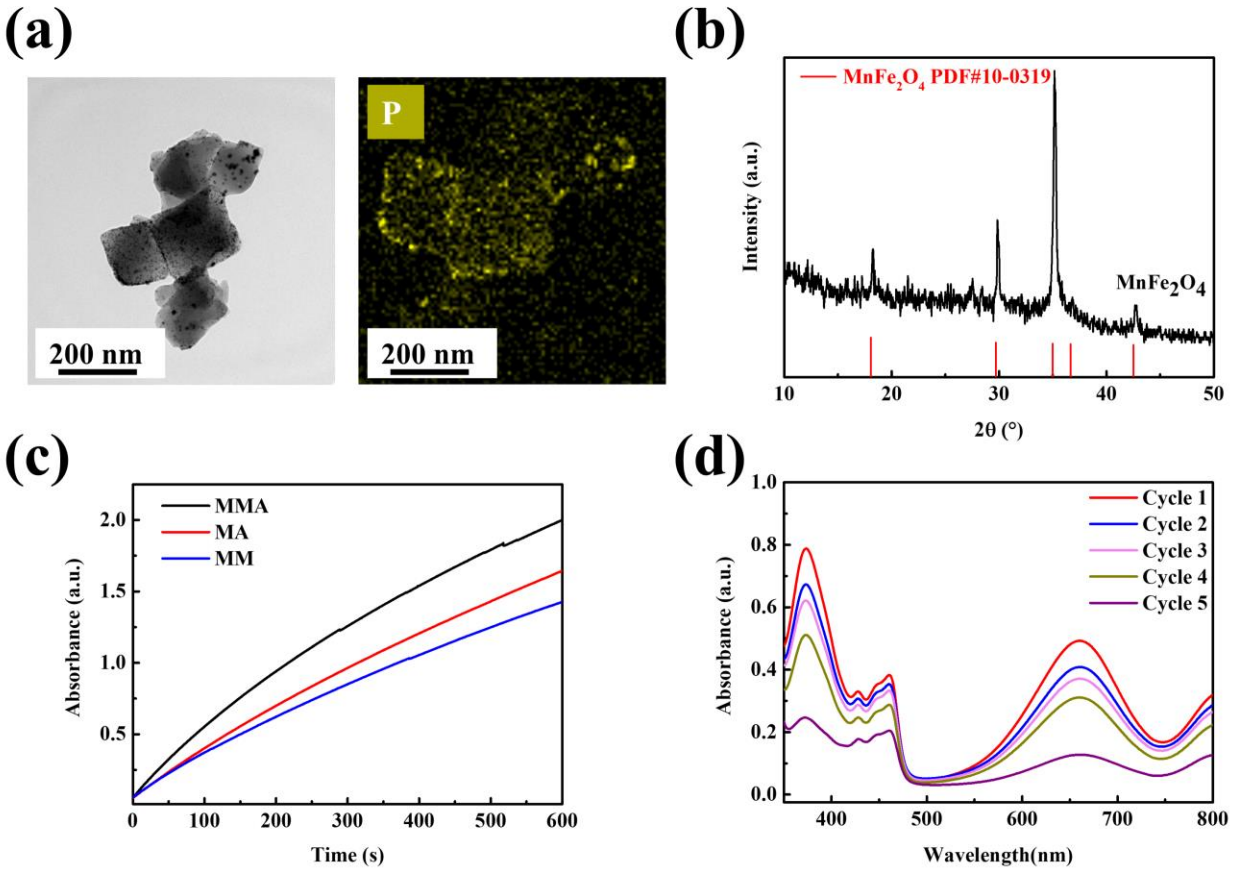

Figure S2. (a) TEM image and EDS elemental mapping (P) of $MnFe_2O_4$@MIL/Au&GOx. (b)

XRD patterns of $MnFe_2O_4$. (c) Time course measurement of the peroxidase-like activity of $MnFe_2O_4$@MIL, MIL/Au, and $MnFe_2O_4$@MIL/Au (100 μg mL^{-1}, respectively) reacted with TMB (3.2 mM) and H_2O_2 (50 mM) in the sodium acetate (NaAc) buffer (pH = 4.0, 20 mM) at 652 nm. (d) Cascade catalytic stability of MMAG. (five cycles)

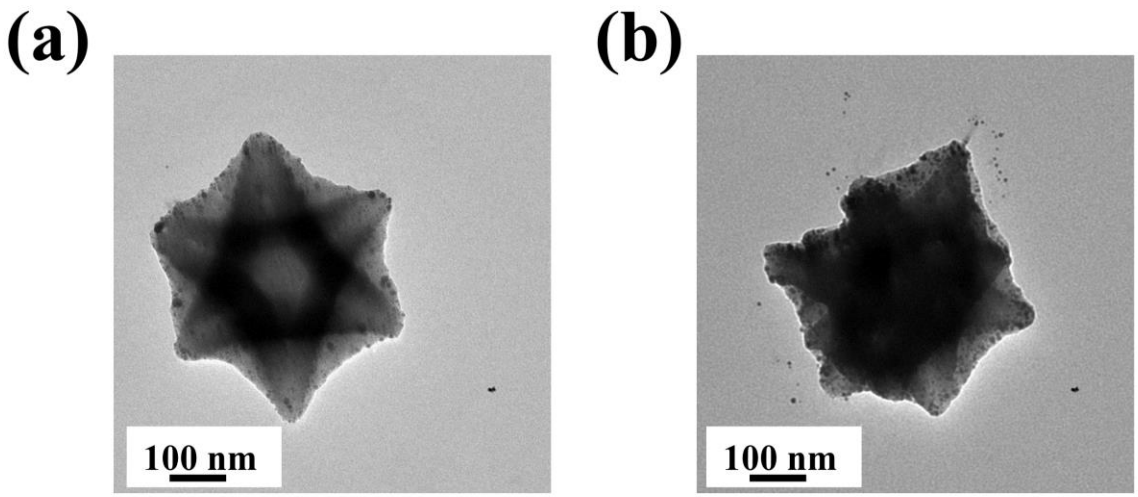

Figure S3. TEM images of MMAG. (a) before MMAG catalyzes glucose and (b) after MMAG catalyzes glucose for 4 h.

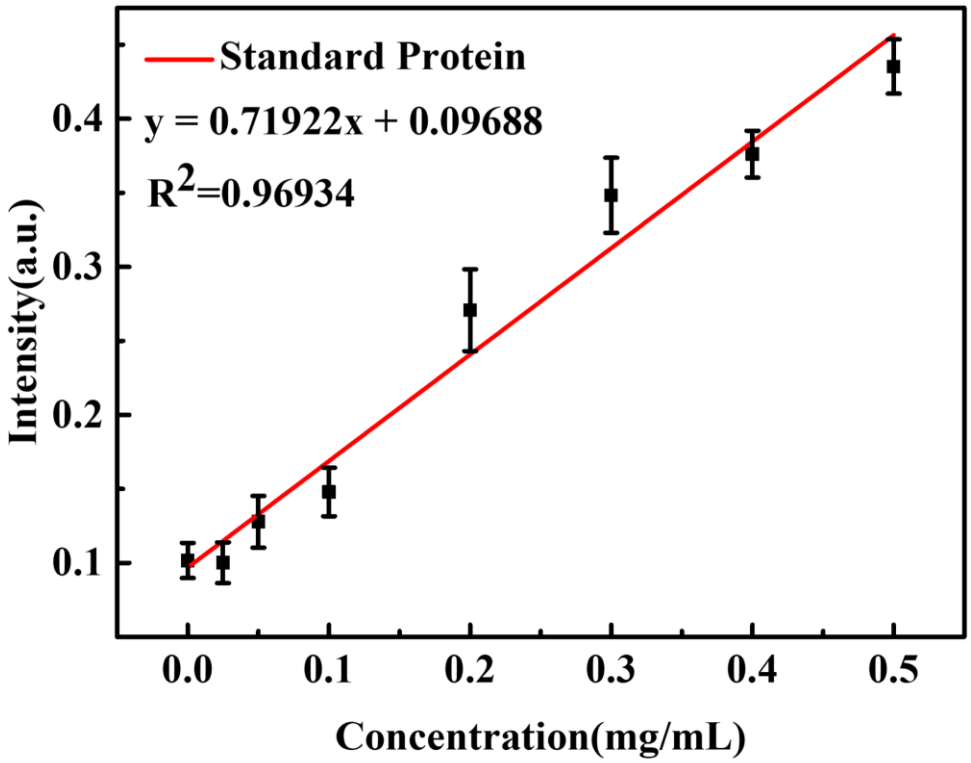

Figure S4. Standard curve of the standard protein applied in BCA protein test. (mean ± SD, n=3)

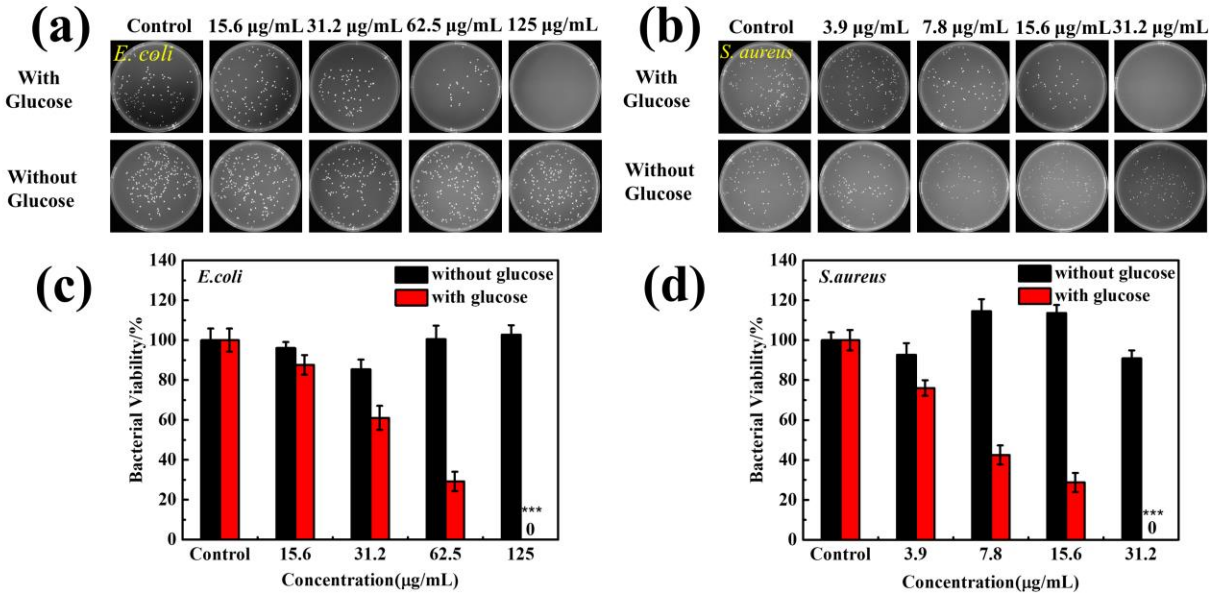

Figure S5. Digital photographs of remaining (a) *E. coli*-inoculated and (b) *S. aureus*-inoculated agar plates and (c,d) corresponding bacterial viability after treatments of MMAG in the presence or absence of glucose. (mean ± SD, n=3, P values: *P < 0.05, **P < 0.01, ***P < 0.001)

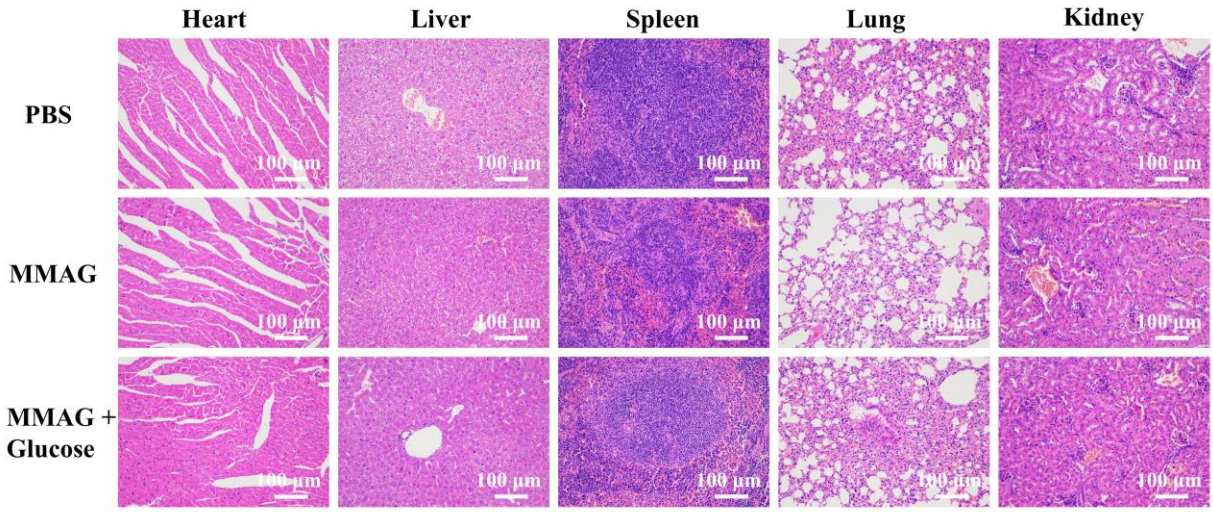

Figure S6. H&E staining images of the main organs upon the treatment with different concentration of PBS, MMAG or MMAG + glucose.

Table S1 Comparisons of dosages and inactivation rates of the MMAG with other antibacterial strategies.

Materials	Mechanism	Dosage (μg mL^{-1})	Inactivation rate (%)	Ref.
urchin-shaped Au@Bi_2S_3	ROS + PTT	140 μg mL^{-1} 120μg mL^{-1}	100% for *E. coli* 100% for *S. aureus*	[1]
UsAuNPs/MOFs	ROS	1000 μg mL^{-1}	99% for *E. coli* 99% for *S. aureus*	[2]
MNP-GOx	ROS	200 μg mL^{-1}	100% for *S. aureus*	[3]
D-CNSs@FeS_2	PTT + Fe^{2+}	500 μg mL^{-1}	99.9% for *E. coli* 99.9% for *S. aureus*	[4]
2D MOF/GOx	ROS	100 μg mL^{-1}	88% for *E. coli* 90% for *S. aureus*	[5]

MMAG	ROS + GSH depletion	125 μg mL^{-1} 31.2μg mL^{-1}	100% for *E. coli* 100% for *S. aureus*	This work

References

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