Supporting Information

Evaluation of *in Vivo* Behavior of Antibacterial Gold Nanoparticles for Potential Biomedical Applications

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Table S1. Bactericidal activity of the A/M-Au NPs indicated by MBC (μg/mL).

Materials	G- bacteria		G+ bacteria	
	E.coli	MDR *E.coli* (ATCC25922)	*S. a*	MRSA (ATCC43300)
A/M-Au NPs	6	12	24	12

Table S2. The Zeta potential of different bacteria treated with A/M-Au NPs.

		E. coli	*S. a*	MDR *E. coli*	MRSA
Zeta Potential (mV)	Without A/M-Au NPs	-33.3±0.43	-20.8±0.46	-32.3±0.53	-21.1±0.57
	With A/M-Au NPs	-30.5±0.26	-19.5±0.41	-31.4±0.72	-20.6±0.23

Table S3. Biocompatibility of different nanomaterials.

Materials	Size	Tolerated dose	Dead dose	Ref
Ag NPs	21.8 nm	120 mg/kg	200 mg/kg	[1]
TMA/MUA-Au NPs	5.2 nm	2 nmol/kg	4 nmol/kg	[2]
A/M-Au NPs	4 nm	600 mg/kg	1000 mg/kg	In this paper

Table S4. Pharmacokinetics of common antibiotics compared with that of A/M-Au NPs.

Materials	C_{max}	$T_{1/2}$	$LD_{50,i.v.}$
Ampicillin	0.5-1 h, 7.6 mg/L	1.5 h	366 mg/kg
Norfloxacin	1-2 h, 2.5mg/L	3-4 h	220 mg/kg
A/M-Au NPs	5-6 h, 2 mg/L	12 h	920 mg/kg

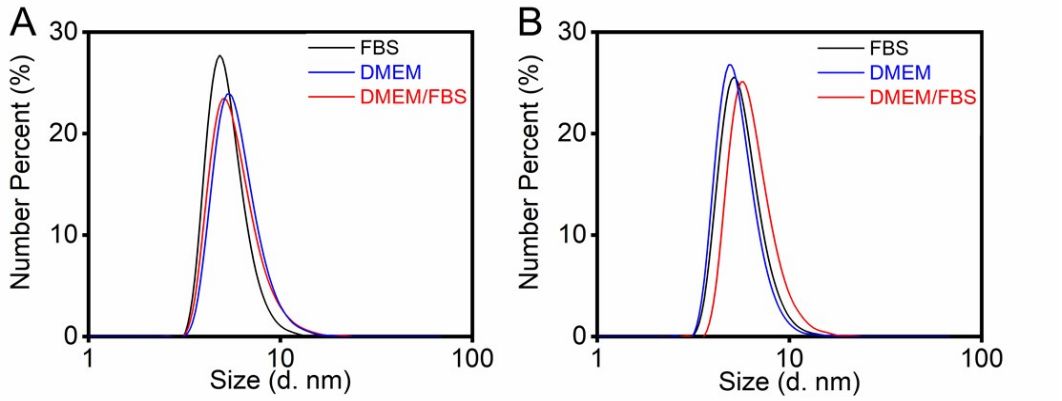

Fig. S1 Stability of A/M-Au NPs. (A) DLS analysis of the A/M-Au NPs incubated in different media for 12 h. (B) DLS analysis of the A/M-Au NPs incubated in different media for 24 h.

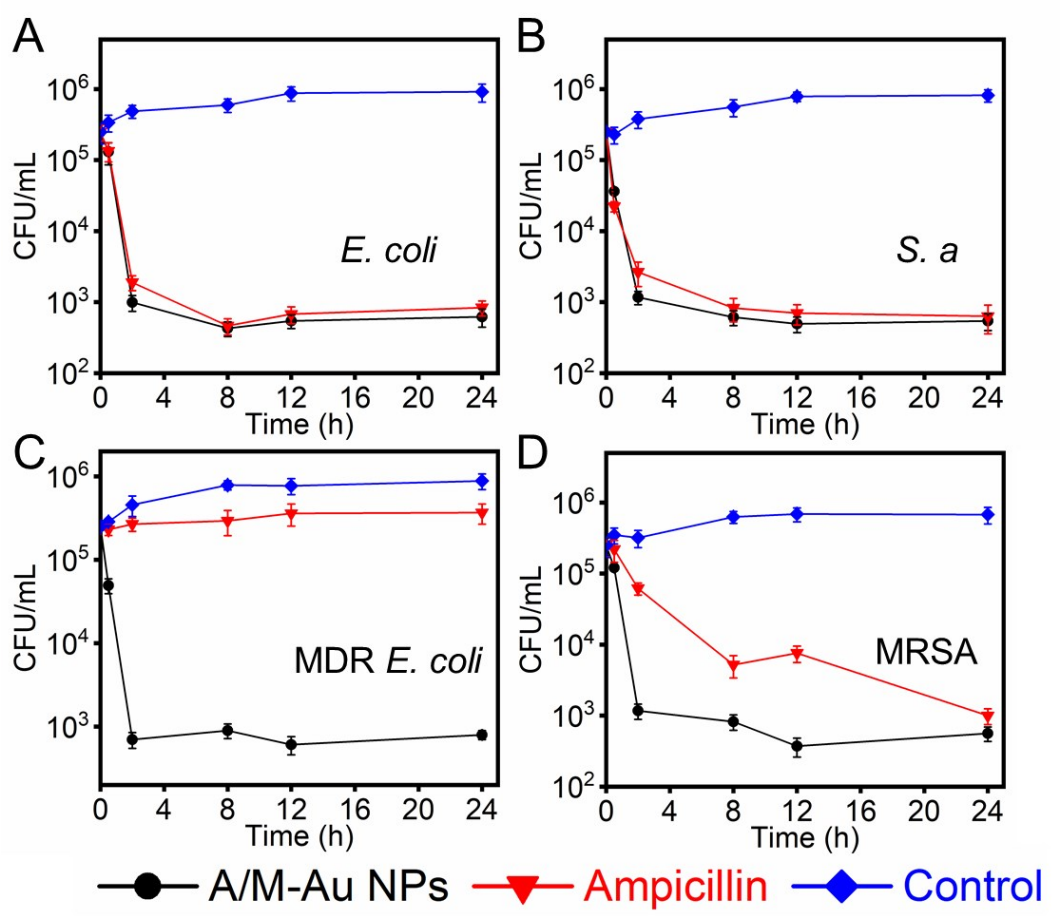

Fig. S2 Bactericidal activities of A/M-Au NPs. Time-dependent killing of (A) *E. coli*, (B) MDR *E. coli*, (C) *S. a* and (D) MRSA treated with A/M-Au NPs.

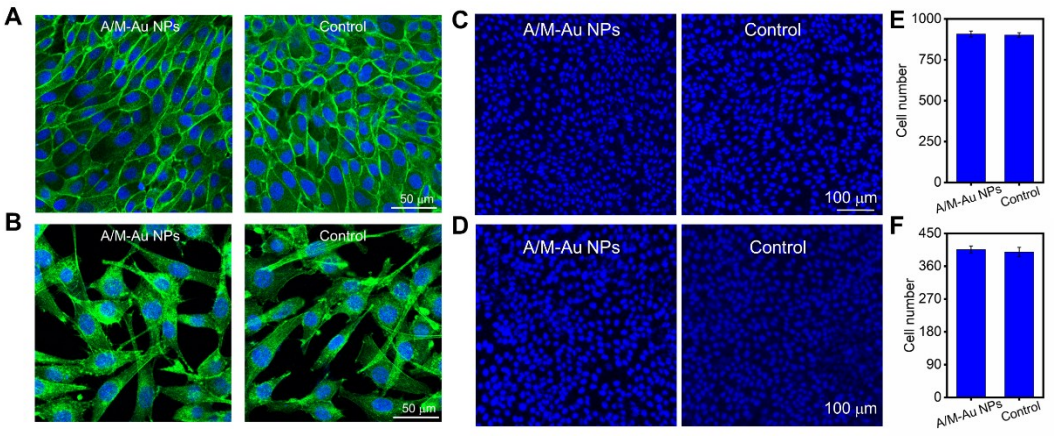

Fig. S3 *In vitro* test of biosafety of A/M-Au NPs. Confocal images show the states of (A) MDCK cells and (B) NIH-3T3 cells incubated with A/M-Au NPs for 3 days. The cells are stained with TM 488 phalloidin / Hoechst to visualize the cytoskeleton and nuclei respectively. Confocal images show (C) MDCK cells and (D) NIH-3T3 cells treated by A/M-Au NPs for 3 days. The numbers of (E) MDCK cells and (F) NIH-3T3 cells are analyzed by counting the cell nuclei. The data are from the mean of each treatment group (Mean ± SD, n=3).

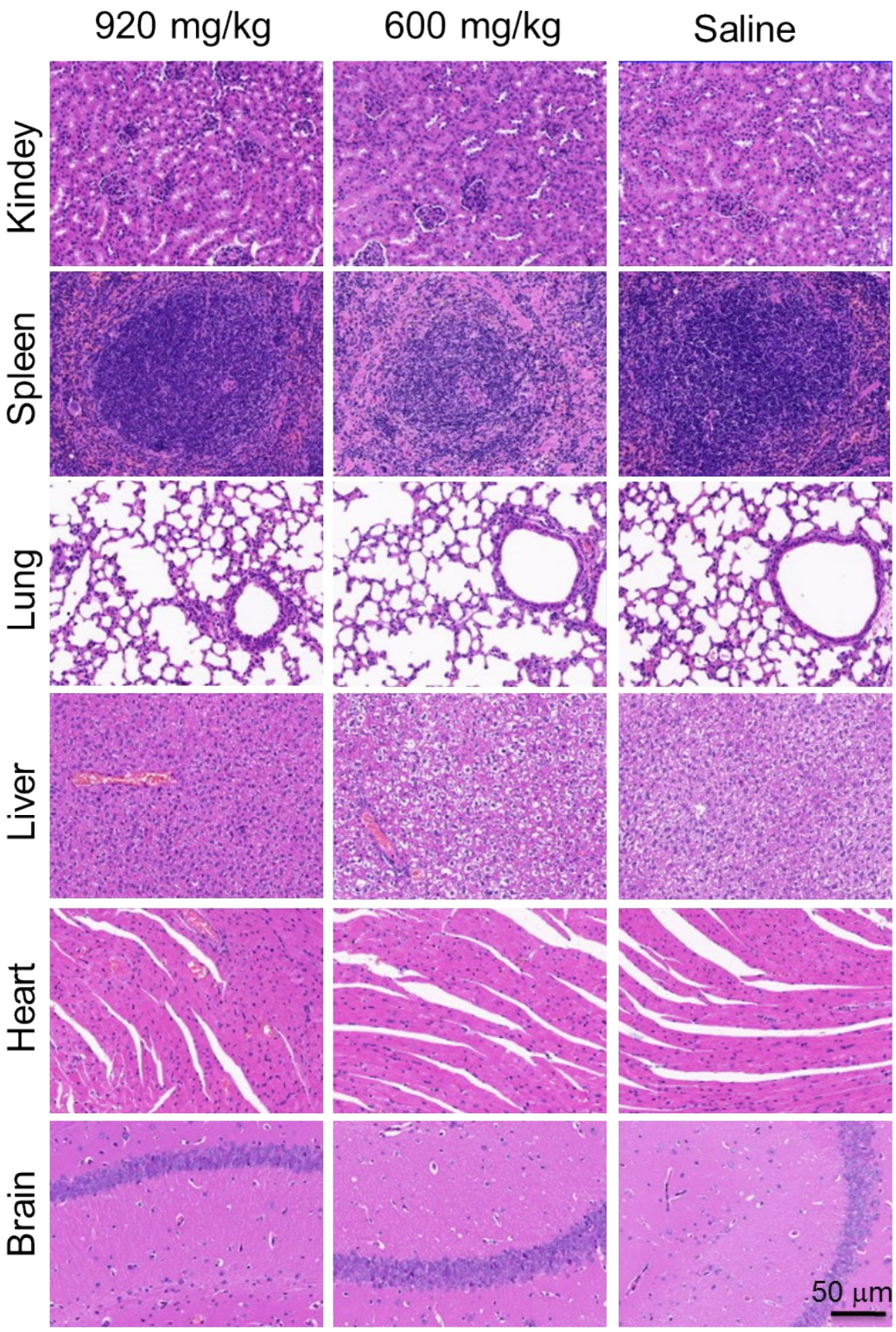

Fig. S4 *In vivo* biosafety evaluation of A/M-Au NPs in mice. It is an enlargement of Fig. 4B.

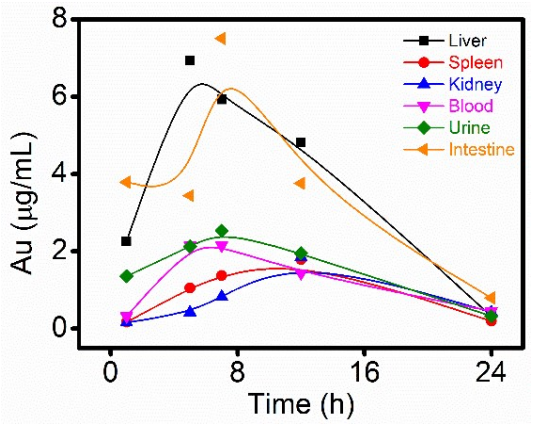

Fig. S5 Pharmacological study and toxicity evaluation of A/M-Au NPs.

References

1. Y. Xue, S. Zhang, Y. Huang, T. Zhang, X. Liu, Y. Hu and Z. Zhang,; M. Tang, *J. Appl. Toxicol.*, 2012, **32**, 890-899.

2. P. P. Pillai, B. Kowalczyk, K. Kandere-Grzybowska, M. Borkowska and B. A. Grzybowski, *Angew Chem. Int. Ed. Engl.*, 2016, **55**, 8610-8614.