

## Electronic Supplementary Information

### **H<sub>2</sub>S-removing UiO-66 MOFs for sensitized antibacterial therapy**

Shaohu Huo,<sup>a, c#</sup> Qianhui Xie,<sup>b #</sup> Min Zhang,<sup>a, #</sup> Zitong Jiang,<sup>a</sup> Ling Fu,<sup>a</sup> Wenhong Li,<sup>a</sup> Chenrong Bian,<sup>a</sup> Kaile Wu,<sup>d</sup>  
\* Yulin Zhu,<sup>a, \*</sup> Xuan Nie,<sup>e, \*</sup> Shenggang Ding<sup>a, b, c \*</sup>

<sup>a</sup> Department of Pediatrics, The First Affiliated Hospital of Anhui Medical University, Hefei, Anhui 230022, China

<sup>b</sup> Department of Pediatrics, The Affiliated Chaohu Hospital of Anhui Medical University, Hefei, Anhui, 238000, China

<sup>c</sup> Beijing Children's Hospital, Capital Medical University, China National Clinical Research Center of Respiratory Diseases, Beijing, China, 100045

<sup>d</sup> Department of Otorhinolaryngology, Head and Neck Surgery, The First Affiliated Hospital of Anhui Medical University, Hefei, Anhui 230022, China

<sup>e</sup> CAS Key Laboratory of Soft Matter Chemistry, Department of Polymer Science and Engineering, University of Science and Technology of China, Hefei 230026, PR China

\* Author to whom correspondence should be addressed.

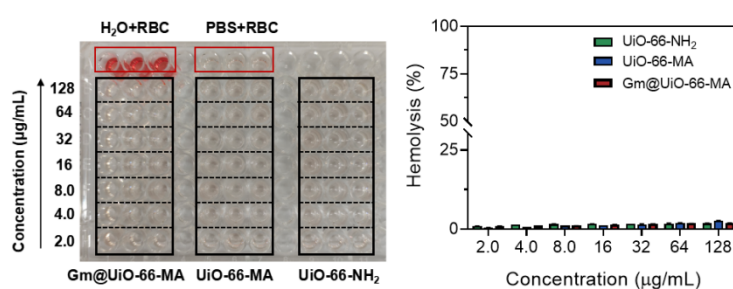
# These authors contributed equally to this work.

**Table S1.** Zone of inhibitions of UiO-66-NH<sub>2</sub>, UiO-66-MA, gentamicin (Gm), Gm@UiO-66-NH<sub>2</sub> and Gm@UiO-66-MA.

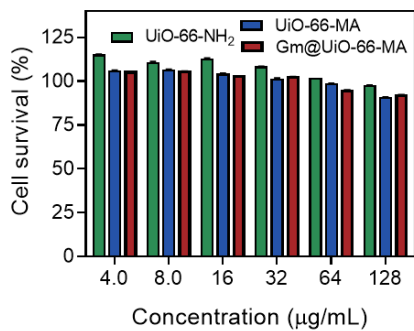
Bacterium	Zone of inhibitions (mm)				
	UiO-66-NH <sub>2</sub>	UiO-66-MA	Gm	Gm@UiO-66-NH <sub>2</sub>	Gm@UiO-66-MA
<i>E. coli</i>	0	0	9.44±0.37	10.23±0.29	24.53±0.36
<i>P. aeruginosa</i>	0	0	16.19±0.42	17.28±0.35	29.85±0.27
Gentamicin-resistant <i>E. coli</i>	0	0	0	0	12.27±0.14

Clinical examination and diagnosis report of the First Affiliated Hospital of Anhui Medical University						
Bacterial species: <i>E. coli</i>			Item: Common bacterial culture and drug sensitivity			
Antibiotic	KB(mm)	MIC( $\mu$ g/mL)	Result	Sensitivity (S)	Intermediar (I)	Resistance (R)
Ampicillin sulbactam		$\geq 32.0$	R	$\leq 8.0$	16.0	$\geq 32.0$
Cefazolin		$\geq 64.0$	R	$\leq 2.0$	4.0	$\geq 8.0$
Cefotetan		$\leq 4.0$	S	$\leq 16.0$	32.0	$\geq 64.0$
Aztreonam		$\leq 1.0$	S	$\leq 4.0$	8.0	$\geq 16.0$
Ertapenem		$\leq 0.5$	S	$\leq 0.5$	1.0	$\geq 2.0$
<b>Gentamicin</b>		<b><math>\geq 16.0</math></b>	<b>R</b>	<b><math>\leq 4.0</math></b>	<b>8.0</b>	<b><math>\geq 16.0</math></b>
Tobramycin		8.0	I	$\leq 4.0$	8.0	$\geq 16.0$
Selectrin		$\geq 320.0$	R	$\leq 40.0$		$\geq 80.0$
Amikacin		$\leq 2.0$	S	$\leq 16.0$	32.0	$\geq 64.0$
Amoxicillin tazobactam		$\leq 4.0$	S	$\leq 8.0$		$\geq 32.0$
Cefazidime		$\leq 1.0$	S	$\leq 4.0$	8.0	$\geq 16.0$
Ciprofloxacin		$\geq 4.0$	R	$\leq 0.2$	0.5	$\geq 1.0$
Cefepime		$\leq 1.0$	S	$\leq 2.0$		$\geq 16.0$
Imipenem		$\leq 1.0$	S	$\leq 1.0$	2.0	$\geq 4.0$
levofloxacin		$\geq 8.0$	R	$\leq 2.0$	4.0	$\geq 8.0$
Ceftriaxone		16.0	R	$\leq 1.0$	2.0	$\geq 4.0$
Ampicillin		$\geq 32.0$	R	$\leq 8.0$	16.0	$\geq 32.0$
Piperacillin	9		R	$\geq 21.0$	18-20	$\leq 17.0$
Cefturoxime	6		R	$\geq 23.0$	15-22	$\leq 14.0$
Cefotaxime	11		R	$\geq 26.0$	23-25	$\leq 22.0$
Cefmetazole	26		S	$\geq 16.0$	13-15	$\leq 12.0$
Meropenem	30		S	$\geq 23.0$	20-22	$\leq 19.0$
Cefperazone-Sulbactam	18		I	$\geq 21.0$	16-20	$\leq 15.0$
Minocycline	25		S	$\geq 16.0$	13-15	$\leq 12.0$
Tigecycline	24		S	$\geq 19.0$	15-18	$\leq 14.0$

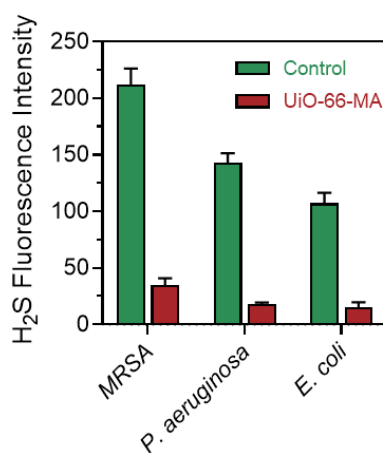
**Fig. S1** Multiple antibiotic resistant information of *E. coli* provided by the Clinical Laboratory of the First Affiliated Hospital of Anhui Medical University.



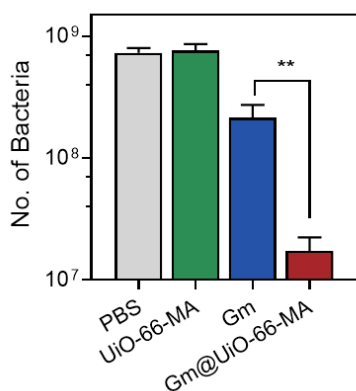
**Fig. S2** Hemolytic activities of UiO-66-NH<sub>2</sub>, UiO-66-MA and UiO-66-MA@Gm for red blood cell.



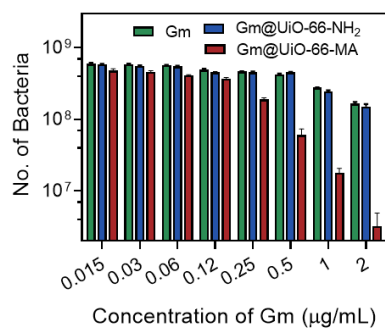
**Fig. S3** The cytotoxicity of UiO-66-NH<sub>2</sub>, UiO-66-MA and UiO-66-MA@Gm.



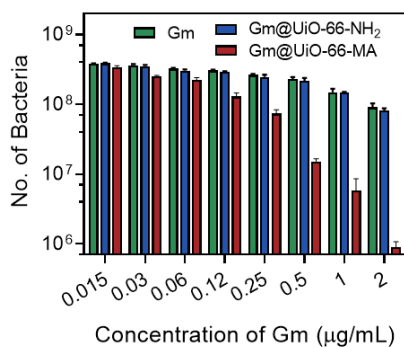
**Fig. S4** H<sub>2</sub>S produced by Multidrug-resistant *Staphylococcus aureus* (MRSA), *P. aeruginosa* and *E. coli* was removed by UiO-66-MA (100 µg/mL).



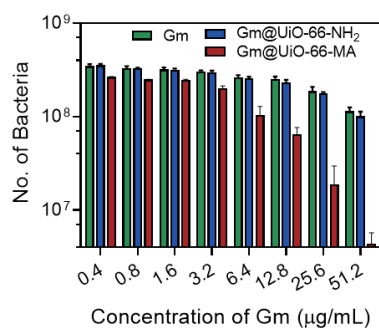
**Fig. S5** Bacterial counting of *E. coli* live/dead staining after treatment with UiO-66-MA, gentamicin, Gm@UiO-66-NH<sub>2</sub>, and Gm@UiO-66-MA.



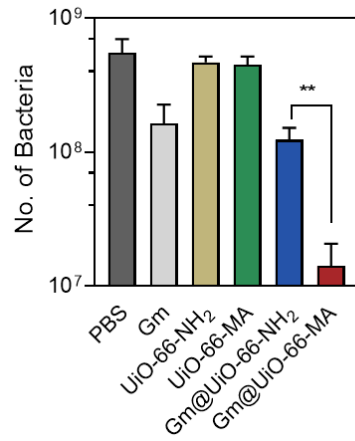
**Fig. S6** Bacterial counting of *E. coli* after treatment with UiO-66-MA, gentamicin, Gm@UiO-66-NH<sub>2</sub>, and Gm@UiO-66-MA.



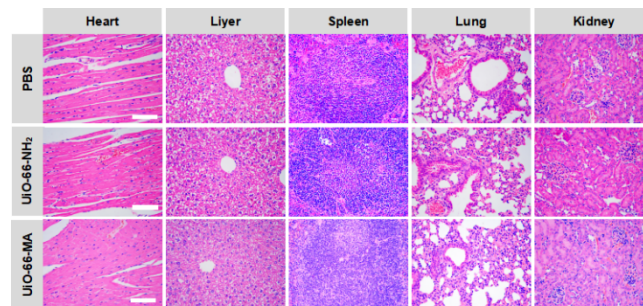
**Fig. S7** Bacterial counting of *P. aeruginosa* after treatment with UiO-66-MA, gentamicin, Gm@UiO-66-NH<sub>2</sub>, and Gm@UiO-66-MA.



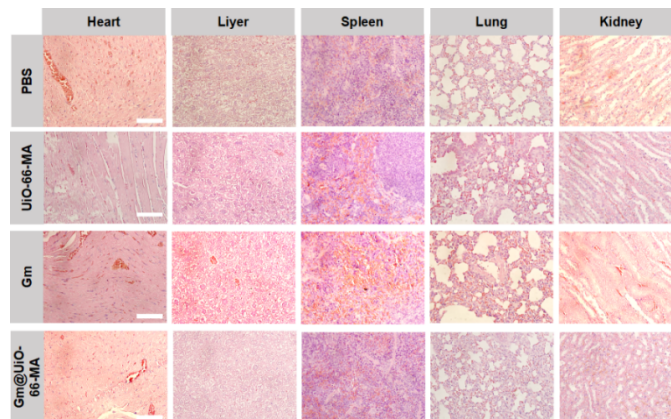
**Fig. S8** Bacterial counting of gentamicin-tolerant *E. coli* after treatment with UiO-66-MA, gentamicin, Gm@UiO-66-NH<sub>2</sub>, and Gm@UiO-66-MA.



**Fig. S9** Bacterial counting of *MRSA* in biofilms after treatment.



**Fig. S10** H&E staining of the main organs (heart, liver, spleen, lung, and kidney) after intravenous injection of UiO-66-NH<sub>2</sub> and UiO-66-MA. Scale bar, 20  $\mu$ m.



**Fig. S11** H&E staining of the main organs (heart, liver, spleen, lung, and kidney) after treatment. Scale bar, 20  $\mu$ m.