

Supporting Information

A multifunctional colorimetric sensor array for bacterial identification and the real-time bacterial elimination to prevent bacterial contamination

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Table S1 The jack-knifed classification procedure on sensor array. Summary of 45 samples classification to nine kinds of bacteria with cross-validation by LDA.

	A	B	C	D	E	F	G	H	I	Correct
A	5	0	0	0	0	0	0	0	0	100 %
B	0	5	0	0	0	0	0	0	0	100 %
C	0	0	5	0	0	0	0	0	0	100 %
D	0	0	0	5	0	0	0	0	0	100 %
E	0	0	0	0	5	0	0	0	0	100 %
F	0	0	0	0	0	5	0	0	0	100 %
G	0	0	0	0	0	0	5	0	0	100 %
H	0	0	0	0	0	0	0	5	0	100 %
I	0	0	0	0	0	0	0	0	5	100 %
Total	5	5	5	5	5	5	5	5	5	100 %
N = 45		N Correct = 45				Proportion Correct = 1.00				

Note: A) *E. coli*, B) *S. aureus*, C) KREC, D) MRSA, E) *S. typhi*, F) *V. parahaemolyticus*, G) *S. flexneri*, H) *B. subtilis*, I) *L. monocytogenes*.

Table S2. Bacterial identification in tap water by using LDA.

Bacteria Samples	Real	Identification	Validity
1	<i>E. coli</i>	<i>E. coli</i>	Correct
2	<i>E. coli</i>	<i>E. coli</i>	Correct
3	<i>E. coli</i>	<i>E. coli</i>	Correct
4	<i>E. coli</i>	<i>E. coli</i>	Correct
5	KREC	KREC	Correct
6	KREC	KREC	Correct
7	KREC	KREC	Correct
8	KREC	KREC	Correct
9	<i>S. aureus</i>	<i>S. aureus</i>	Correct
10	<i>S. aureus</i>	<i>S. aureus</i>	Correct
11	<i>S. aureus</i>	<i>S. aureus</i>	Correct
12	<i>S. aureus</i>	<i>S. aureus</i>	Correct
13	MRSA	MRSA	Correct
14	MRSA	MRSA	Correct
15	MRSA	MRSA	Correct
16	MRSA	MRSA	Correct
17	<i>S. typhi</i>	<i>S. typhi</i>	Correct
18	<i>S. typhi</i>	<i>S. typhi</i>	Correct
19	<i>S. typhi</i>	<i>S. typhi</i>	Correct
20	<i>S. typhi</i>	<i>S. typhi</i>	Correct
21	<i>L. monocytogenes</i>	<i>L. monocytogenes</i>	Correct
22	<i>L. monocytogenes</i>	<i>L. monocytogenes</i>	Correct
23	<i>L. monocytogenes</i>	<i>L. monocytogenes</i>	Correct
24	<i>L. monocytogenes</i>	<i>L. monocytogenes</i>	Correct
25	<i>B. subtilis</i>	<i>B. subtilis</i>	Correct
26	<i>B. subtilis</i>	<i>B. subtilis</i>	Correct
27	<i>B. subtilis</i>	<i>B. subtilis</i>	Correct
28	<i>B. subtilis</i>	<i>B. subtilis</i>	Correct
29	<i>V. parahaemolyticus</i>	<i>V. parahaemolyticus</i>	Correct
30	<i>V. parahaemolyticus</i>	KREC	Incorrect
31	<i>V. parahaemolyticus</i>	<i>V. parahaemolyticus</i>	Correct
32	<i>V. parahaemolyticus</i>	<i>V. parahaemolyticus</i>	Correct
33	<i>S. flexneri</i>	<i>S. flexneri</i>	Correct
34	<i>S. flexneri</i>	<i>S. flexneri</i>	Correct
35	<i>S. flexneri</i>	<i>S. flexneri</i>	Correct
36	<i>S. flexneri</i>	<i>S. flexneri</i>	Correct
Total = 36	Correct = 35	Incorrect = 1	Correct rate = 97.2 %

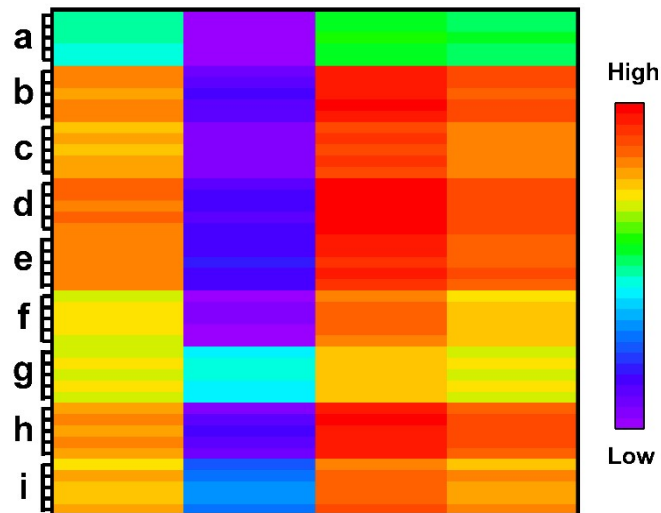


Figure S1. Heat map of the sensor array against nine kinds of pathogenic bacteria. a) *E. coli*, b) KREC, c) *S. aureus*, d) MRSA, e) *S. typhi*, f) *L. monocytogenes*, g) *B. subtilis*, h) *V. parahaemolyticus*, i) *S. flexneri*.

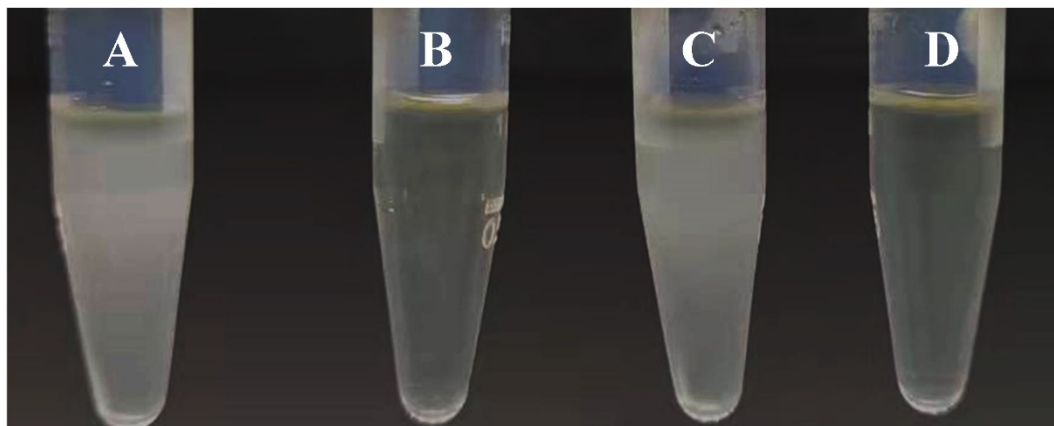


Figure S2. The antibacterial activities of HAuCl₄ treatments toward KREC and MRSA as determined by turbidity assays in LB medium. (A) KREC, (B) KREC with HAuCl₄ treatment, (C) MRSA and (D) MRSA with HAuCl₄ treatment.

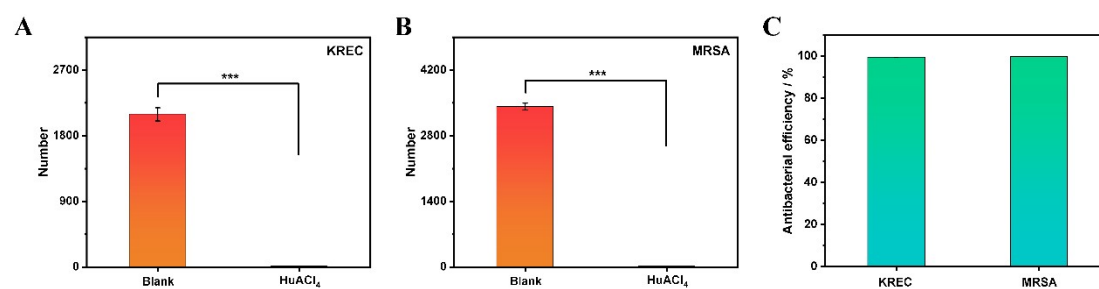


Figure S3. Quantitative analysis of the number of KREC (A) and MRSA (B) after different treatments, and the antibacterial ability of sensor array for KREC and MRSA (C). *P < 0.05, **P < 0.01, ***P < 0.001.

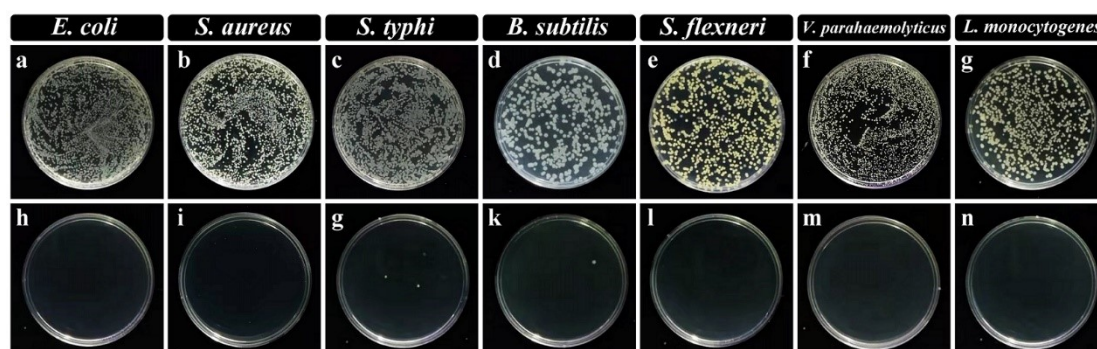


Figure S4. Agar plates of seven kinds of bacteria without (a-g) or with (h-n) H₂AuCl₄ treatment.

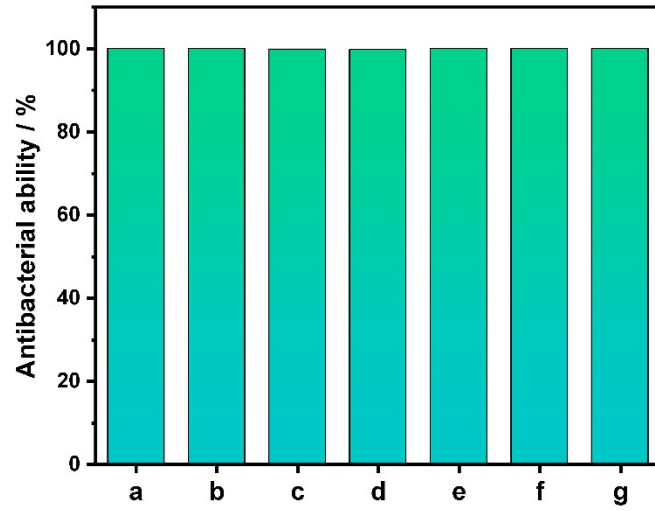


Figure S5. The antibacterial ability of sensor array for seven kinds of bacteria. a) *E. coli*, b) *S. aureus*, c) *S. typhi*, d) *B. subtilis*, e) *S. flexneri*, f) *V. parahaemolyticus*, g) *L. monocytogenes*.