

Supporting Information

A Dot-Array Magnetic Enrichment Strategy for Rapid, Multiplexed Detection of Viable Bacteria via ATP Bioluminescence

Supplementary Figures

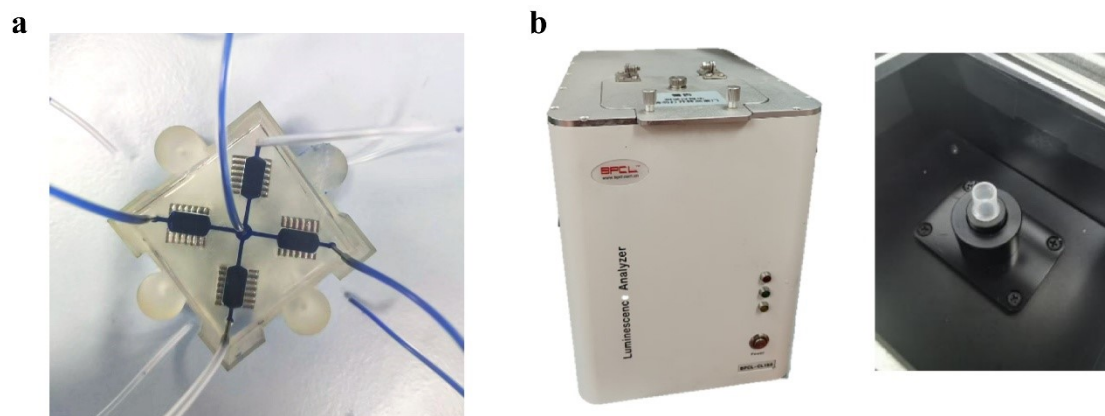


Fig. S1. Physical images of the microfluidic device and the luminescence analyzer. **a** Physical image of the microfluidic device. **b** BPCL-CL150 Luminescence Analyzer.

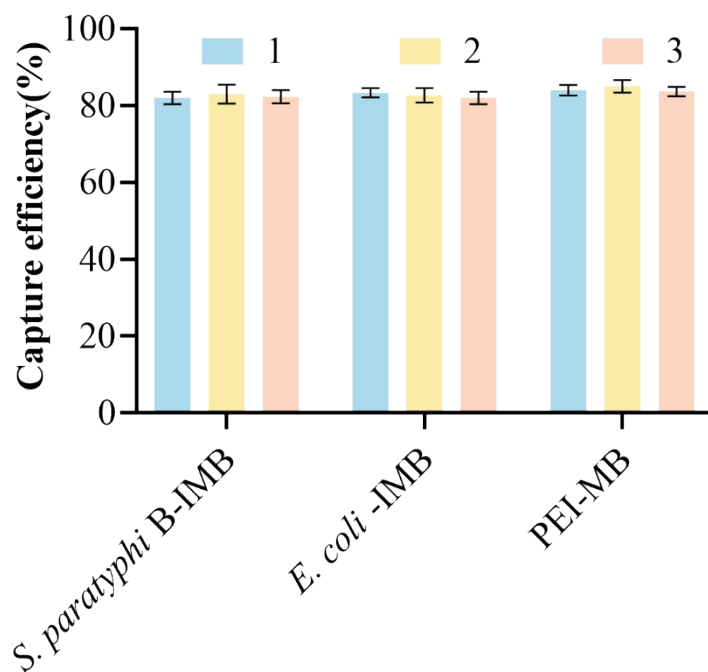


Fig. S2. Batch-to-Batch Reproducibility of Capture Efficiency for Functionalized Magnetic Beads

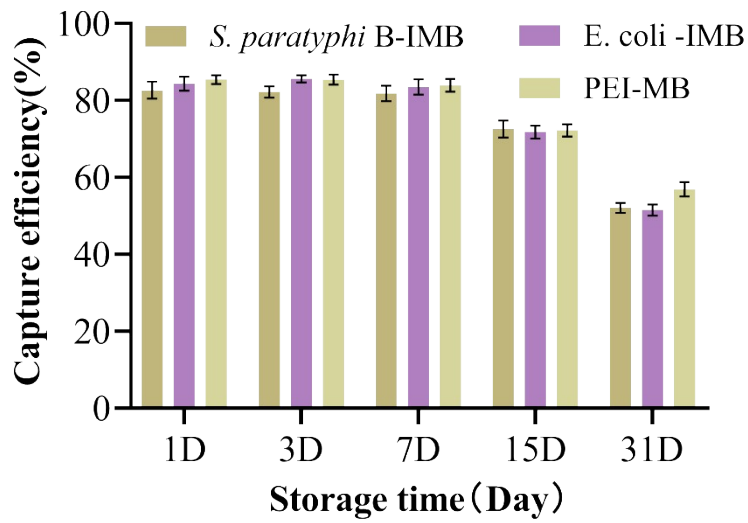


Fig. S3 Storage stability of functionalized magnetic beads at 4°C

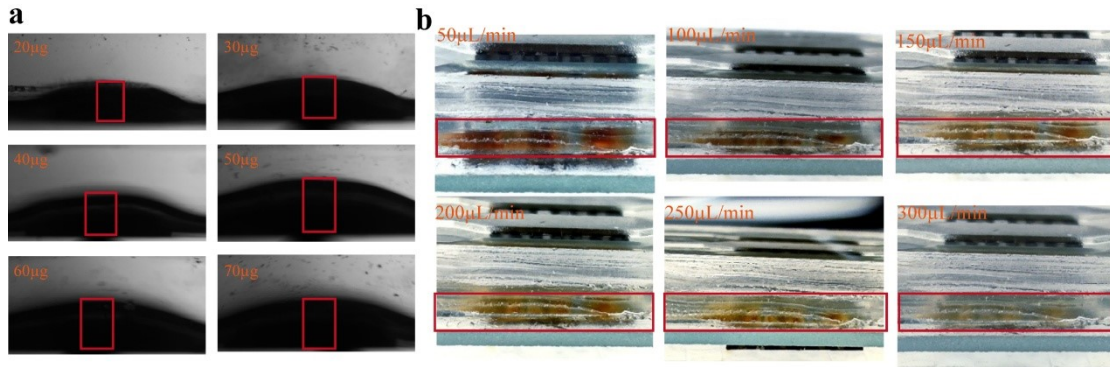


Fig. S4. Optimization of magnetic bead amount and fluid flow rate. **a** Effect of magnetic bead amount on the height of the bead chain. At a constant flow rate, the bead chain height gradually increases with increasing bead amount.

b Effect of fluid flow rate on the stability of the bead chain.

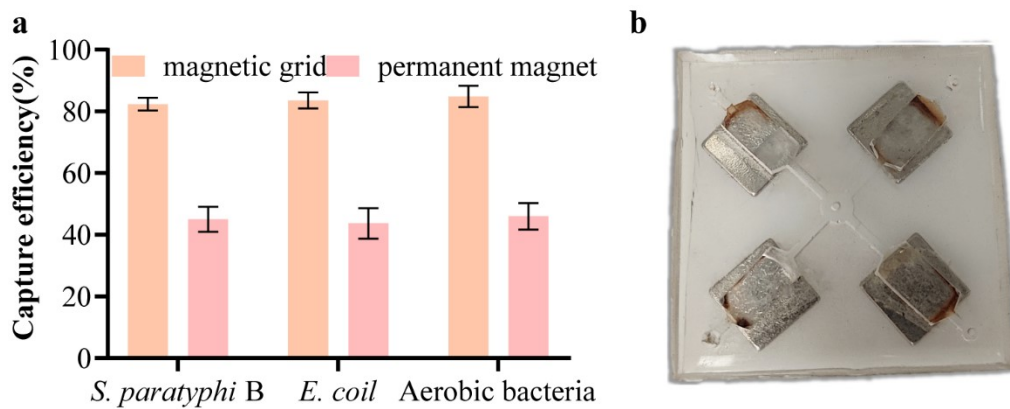


Fig. S5. **a** Comparison of bacterial capture efficiency: Magnetic grating versus single-point permanent magnet. **b** Distribution of functionalized magnetic beads in the microfluidic channel under the action of the permanent magnet

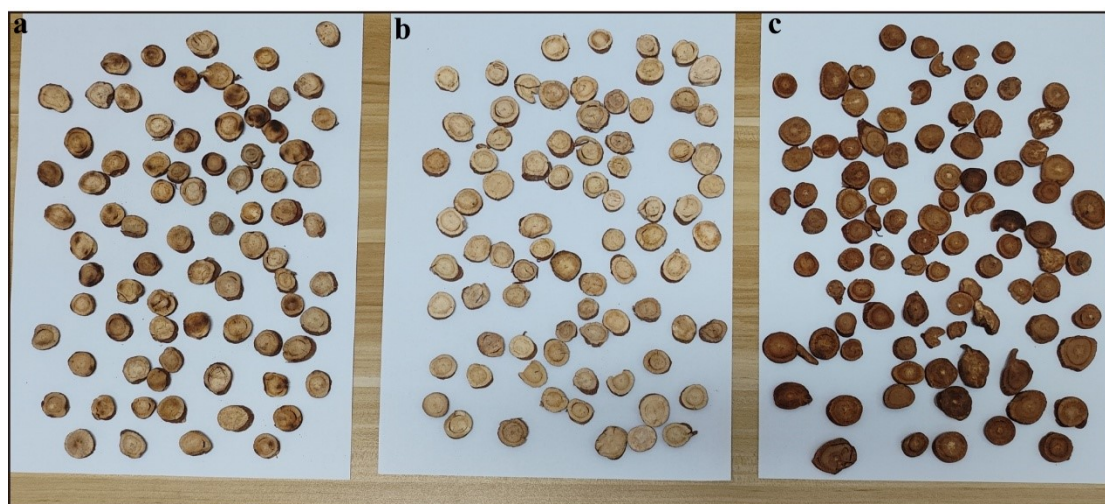


Fig. S6. **a** stir-fried licorice. **b** raw licorice. **c** honey-fried licorice.

Table S1. Recovery results of three spiked bacteria in raw licorice ($n = 3$)

Sample	Microorganism	Theoretical (CF U/mL)	Developed method (CF U/mL)	Recovery (%)	RSD (%)
RL	<i>S. paratyphi</i> B	1.56×10^3	4.87×10^5	96	4.08
RL	<i>S. paratyphi</i> B	1.56×10^4	7.11×10^6	101	2.02
RL	<i>S. paratyphi</i> B	1.56×10^5	6.39×10^7	98	2.50
RL	<i>E. coil</i>	1.42×10^3	2.42×10^5	93	2.19
RL	<i>E. coil</i>	1.42×10^4	4.48×10^6	102	2.95
RL	<i>E. coil</i>	1.42×10^5	2.35×10^7	95	1.74
RL	Aerobic	1.75×10^3	2.70×10^5	95	3.75
RL	Aerobic	1.75×10^4	4.64×10^6	101	1.02
RL	Aerobic	1.75×10^5	3.62×10^7	99	1.67

Table S2. Two-way ANOVA of the effects of incubation time and microbial species on microbial counts in licorice samples

Herbal pieces	Source of Variation	DF	F-value	P-value	% of Total Variation
HFL	Incubation time	2	363.7	<0.0001	94.14
	Microbial	2	12.2	0.0027	3.159
	Incubation time * Microbial	4	2.974	0.0805	1.54

SFL	Incubation time	2	17.26	0.0008	5.823
	Microbial	2	270.6	<0.0001	91.27
	Incubation time	4	2.066	0.1682	1.394
	* Microbial				
RL	Incubation time	2	2.038	0.1863	0.6219
	Microbial	2	308.4	<0.0001	94.12
	Incubation time	4	6.356	0.0103	3.880
	* Microbial				