

Figure S1. Optimization of magnetic material synthesis conditions (Pathogen concentration: 10^7 CFU/mL) and MNP dosage (Pathogen concentration: 10^5 CFU/mL). Curves a and b correspond to *E. coli* and *S. aureus*, respectively. (a) The mass of 1,6-hexamethylenediamine dosage. (b) The synthesis temperature. (c) The amount of MNPs.

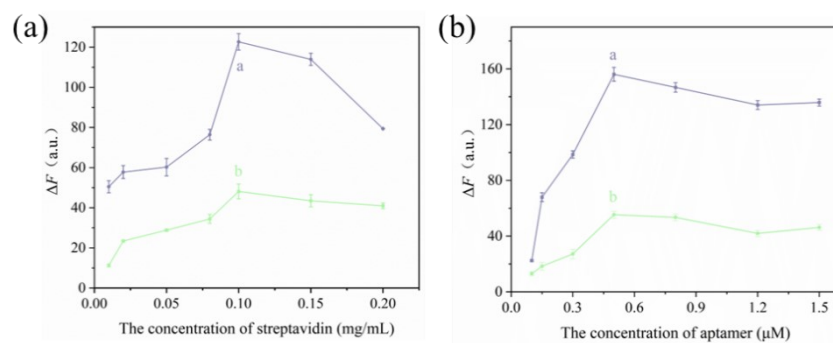


Figure S2. Optimization of MNP modification conditions (Pathogen concentration: 10^5 CFU/mL). Curves a and b correspond to *E. coli* and *S. aureus*, respectively. (a) The concentration of streptavidin. (b) The concentration of aptamer.

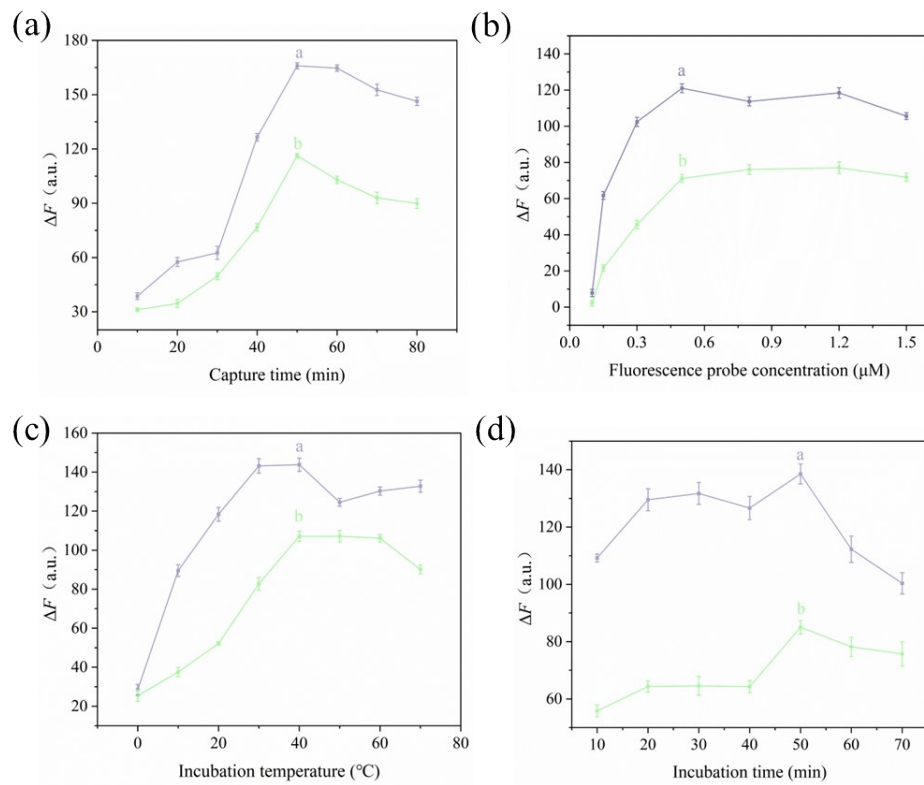


Figure S3. Optimization of bacterial capture time, fluorescent probe dosage and fluorescent probe incubation conditions. Pathogen concentration: 10^4 CFU/mL. Curves a and b correspond to *E. coli* and *S. aureus*, respectively. (a) The time of capture. (b) The concentration of fluorescence probe. (c) The temperature of incubation. (d) The time of incubation.

Table S1 Sample test results

Sample	Target	Spiked (lgC)	Detection	Capture Efficiency (%)
Milk	<i>E.coli</i>	2.0	119.8±6.9	102.7
		3.0	1146.2±6.3	105.8
		4.0	11197.1±128.1	103.4
		5.0	102983.7±1423.0	95.1
	<i>S. aureus</i>	2.0	104.4±1.1	84.4
		3.0	939.6±15.7	91.5
		4.0	9294.5±781.7	90.5
		5.0	107510.1±2454.0	104.7
Cucumber	<i>E.coli</i>	2.0	83.5±2.7	97.9
		3.0	1158.8±0.0	101.0
		4.0	10237.5±32.4	90.0
		5.0	96950.9±612.7	85.3
	<i>S. aureus</i>	2.0	112.3±2.8	97.9
		3.0	1173.2±26.8	93.9
		4.0	11229.4±142.0	89.8
		5.0	117308.4±1950.3	93.8
Beef	<i>E.coli</i>	2.0	93.6±2.4	90.8
		3.0	1103.0±7.0	95.3
		4.0	9835.6±217.4	85.0
		5.0	100194.6±838.1	86.6
	<i>S. aureus</i>	2.0	115.2±1.5	87.0
		3.0	1036.5±0.0	96.3
		4.0	9498.7±0.0	88.2
		5.0	1102.87.0±2758.9	102.4

Table S2 Comparison of experimental method with standard method

Sample	Target	Spike (lgC)	Standard Methods (CFU/mL) ($\bar{x} \pm \delta$)	This Methods (CFU/mL) ($\bar{x} \pm \delta$)	RE (%)
Milk	<i>E.coli</i>	2.0	116.7±15.3	119.8±6.9	2.7
		5.0	108333.3±5686.2	102983.7±1423.0	-4.9
	<i>S. aureus</i>	2.0	123.7±5.5	104.4±1.1	-15.6
		5.0	102666.7±3055.1	107510.1±2454.0	4.7
Cucumber	<i>E.coli</i>	2.0	85.3±4.5	83.5±2.7	-2.1
		5.0	113666.7±4509.2	96950.9±612.7	-14.7
	<i>S. aureus</i>	2.0	132.3±12.5	112.3±2.8	-12.9
		5.0	107666.7±9291.6	117308.4±1950.3	2.4
Beef	<i>E.coli</i>	2.0	103.0±5.3	93.6±2.4	-9.2
		5.0	115666.7±3055.1	100194.6±838.1	-13.4
	<i>S. aureus</i>	2.0	114.7±9.1	115.2±1.5	-2.1
		5.0	125000.0±4582.6	1102.87.0±2758.9	-6.2