Supporting Information

Label-free Colorimetric Aptasensor for Detection of *Escherichia coli* Based on Gold Nanoparticles with Peroxidase-like Amplification

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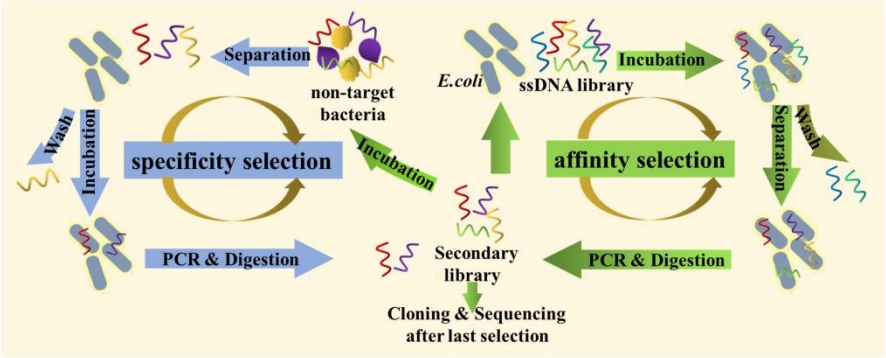

Scheme S1. Schematic diagram of Cell-SELEX

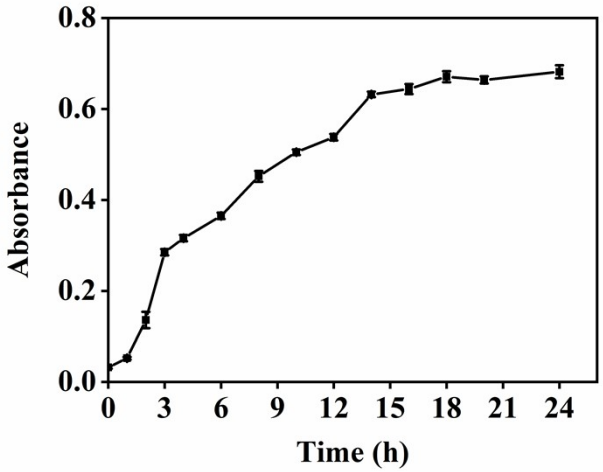

Figure S1. Growth curve of *E.coli*

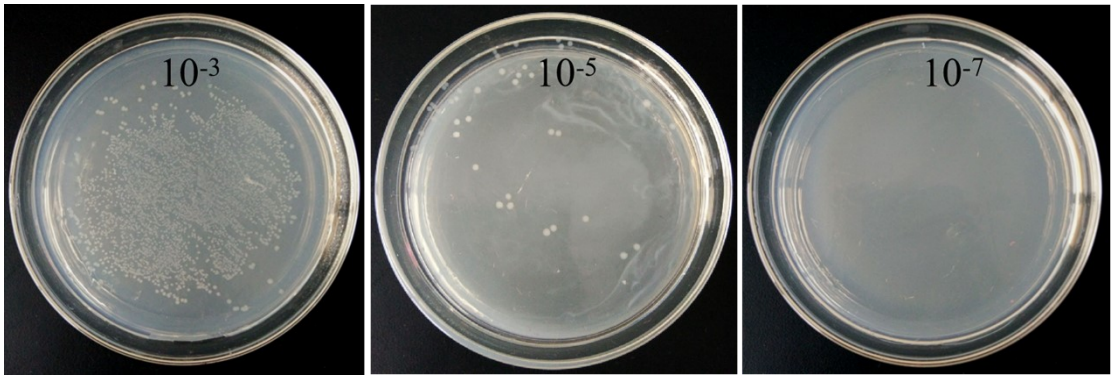

Figure S2. Colony diagram of *E.coli*

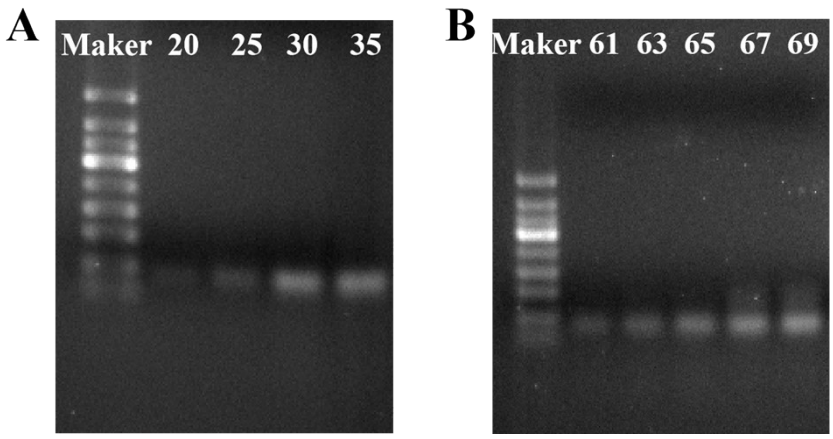

Figure S3. Optimization of PCR conditions (A) Number of cycles; (B) Annealing temperature;

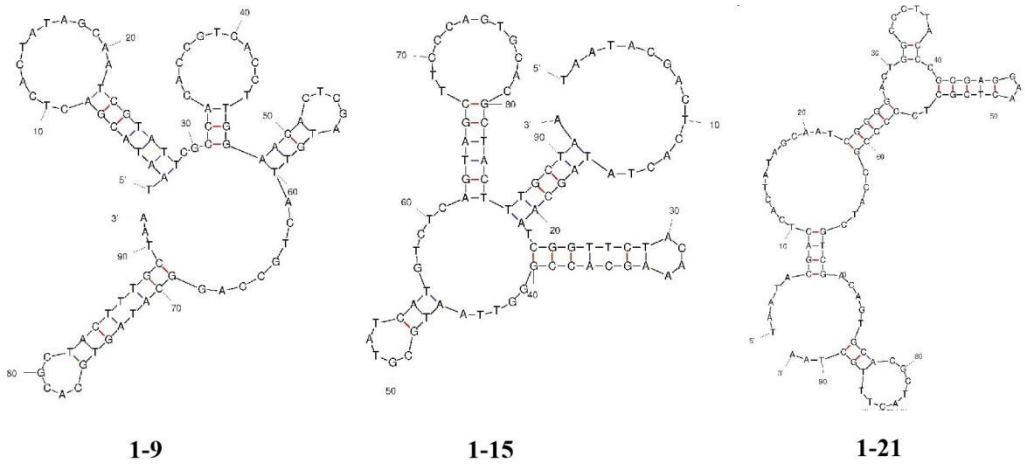

Figure S4. Secondary structures of sequences

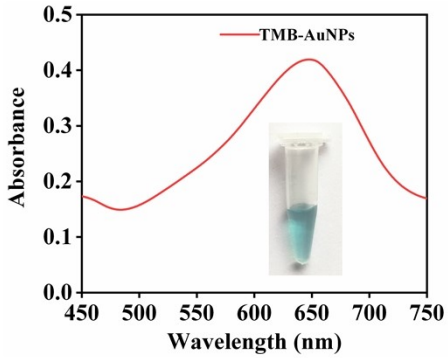

Figure S5. Spectrum and color image of TMB-AuNPs

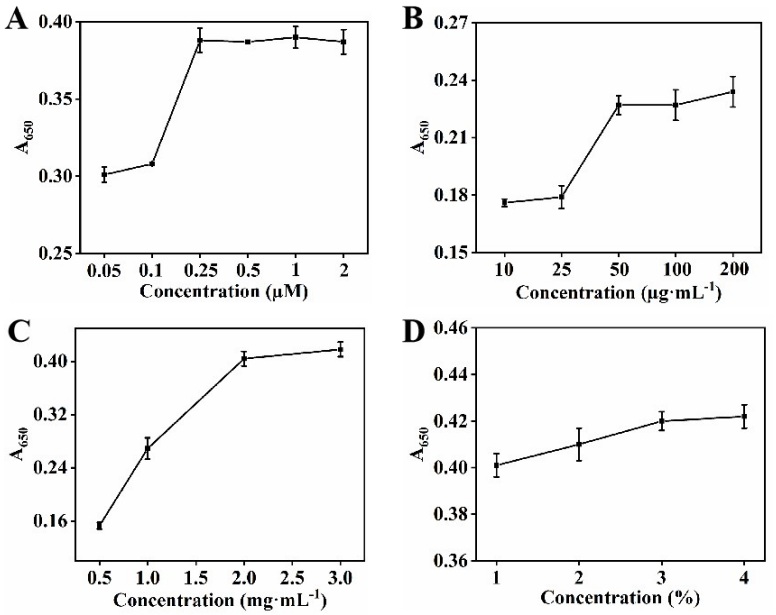

Figure S6. Optimization of the detection conditions (A) Aptamer concentration; (B) CTAB concentration; (C) TMB concentration; (D) H_2O_2 concentration;

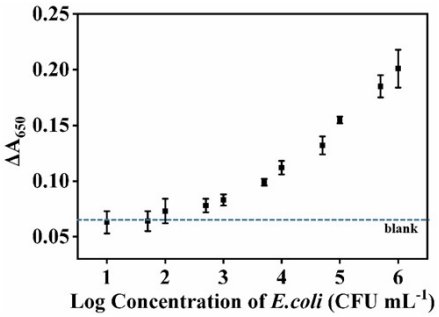

Figure S7. Changes of ΔA_{650} at the concentration of *E. coli* from 1×10^1 to 1×10^6

63 **Table S1** The conditions for aptamers selection

Selection round	ssDNA (nmol)	Concentration of E.coli (CFU/mL)	counter target (CFU/mL)	Incubation time of ssDNA library and targets（min）
1	250	10^5	-	120
2	150	10^5	-	90
3	150	10^5	-	90
4	150	10^5	-	90
5	100	10^5	-	60
6	100	10^5	-	60
7	100	10^5	-	60
8	50	10^5	10^5	40
9	50	10^5	-	40
10	50	10^5	-	40
11	50	10^5	-	40

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65 **Table S2** The sequences from 5'-3'

Name	Sequences 5'-3'
1-9	TAATACGACTCACTATAGCAATCGTATTCGCCACACCGTCACCTTGGAACACTCGA TGTTACTGCCAGGCATAGTGCACGCTACTTTGCTAA
1-15	TAATACGACTCACTATAGCAATCGGTTCTACAAAGCACCGGGTTAATGCGTATCAT GTCTCAGTAGCTTCCCAGTGCACGCTACTTTGCTAA
1-21	TAATACGACTCACTATAGCAATCGGGGACTGGCCCTTACCCGCGAGGAACTCGCT CCCCCGCCATCGTCGACAGTGCACGCTACTTTGCTAA

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Table S3 Comparison of colorimetric methods for *Escherichia coli* detection

Analyte	Strategy	Linear range	LOD	Matrix	Ref
Escherichia coli	based on bacterial inhibition of glucose oxidase-catalyzed reaction	10^4-10^8 CFU mL^{-1}	7.48×10^3 CFU mL^{-1}	/	[1]
Escherichia coli	aptamers immobilized on nitrocellulose membranes housed within a microfluidic system and HRP-TMB color reaction	/	10^4 CFU mL^{-1}	joint fluids	[2]
Escherichia coli O157:H7	dependent on the electrostatic interaction between bacteria and negatively charged AuNPs by adjusting the pH	/	4.4×10^7 CFU mL^{-1}	/	[3]
Escherichia coli	based on 4-mercaptophenylboronic acid functionalized AuNPs	10^4-10^7 CFU mL^{-1}	1.02×10^3 CFU mL^{-1}	tap water; bottled water	[4]
Escherichia coli	using the peroxidase-like activity of chitosan-coated iron oxide magnetic nanoparticles	10^2-10^6 CFU mL^{-1}	10^2 CFU mL^{-1}	/	[5]
Escherichia coli O157:H7	based on label-free aptamers and AuNPs	/	10^5 CFU mL^{-1}	/	[6]
Escherichia coli	through the capture of AuNPs by chimeric phages	/	10^2 CFU mL^{-1}	/	[7]
Escherichia coli	using a supramolecular enzyme-nanoparticle	/	10^4 CFU mL^{-1}	/	[8]
Escherichia coli	based on the enzyme-induced metallization of gold nanorods	/	10^5 CFU mL^{-1}	/	[9]
Escherichia coli	using AuNPs with peroxidase-like activity to catalyze the oxidation of TMB by hydrogen peroxide to produce color development	5×10^2-10^6 CFU mL^{-1}	75 CFU mL^{-1}	water; juice; milk	this work

Reference

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