Supplementary Information

Cationic liposomes-triggered luminol chemiluminescence reaction and its applications

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Table S1 Sequences of oligonucleotides used in this work

Primer name	Sequence (5' to 3')
ATP aptamer	AGAGAACCTGGGGGAGTATTGCGGAGGAAGGTA$_{10}$-NH_2
Reporter DNA	TCCCCCAGGTTCTCTAAAAACCCCCAAAAACCCCC
Reporter DNA1	TCCCCCAGGTTCTCTAAAAACCCCCAAAAACCCCC-6FAM
Capture DNA	NH_2-A_{20}ACCTTTAACCTAATCTCCTC
Target DNA	TGGGAGGAGTTGGGGGAGGAGATTAGGTTAAAGGT
One-base mismatched DNA	TGGGAGGAGTTGGGGGAAGAGATTAGGTTAAAGGT
Two-base mismatched DNA	TGGGAGGAGTTGGGGGACGAGAATAGGTTAAAGGT
Random DNA	TGTCCGTGCTAGAAGGAAACAGTTACCA

Table S2 The quenching effect of various free radical scavengers on the luminol-H_2O_2-cationic liposomes CL reaction

Quenchers	Concentration	Percent inhibition (%)
Ascorbic acid	0.03 mg mL^{-1}	99%
DMSO	5%	47%
Sodium azide	25 mM	69%
SOD	10 U	46%
N_2		8%

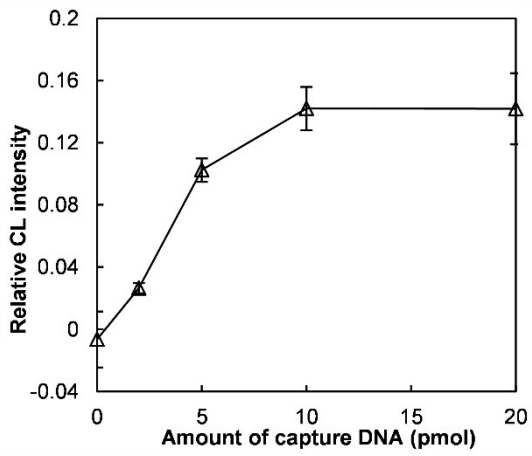

Fig. S1 Effect of capture DNA amount on the detection of sequence-specific DNA. The CL signal increased with the increase of capture DNA amount ranging from 0 to 10 pmol, and leveled off when the amount of capure DNA was higher than 10 pmol. Thus, 10 pmol of capture DNA which is immobilized on 60 μg of magnetic beads was employed in the DNA hybridization experiment.

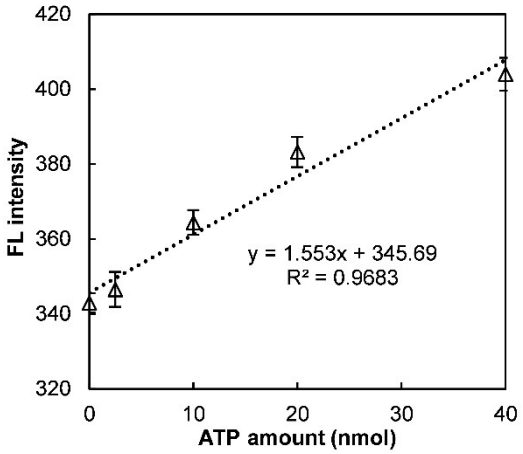

Fig. S2 FL response with the addition of increasing amount of ATP. The reporter DNA1 employed in FL experiments has the same sequence to the reported DNA employed in CL experiments and has a FAM label on the 3'-end. As a parallel experiment, the procedure of FL experiments was similar to the CL detection procedure for ATP. Firstly, the anti-ATP aptamer was immobilized on the surface of magnetic beads and then hybridized with reported DNA1. After washing with washing buffer, ATP was added in the hybridized magnetic beads. The competitive binding of ATP with anti-ATP aptamer resulted in the liberation of the reported DNA1 from the magnetic beads. The reaction mixtures were separated by an external magnet, and the supernatants were transferred to the wells of a 96-well plate. Finally, the FL intensity of the supernatants at 525 nm was detected with an excitation wavelength at 490 nm.

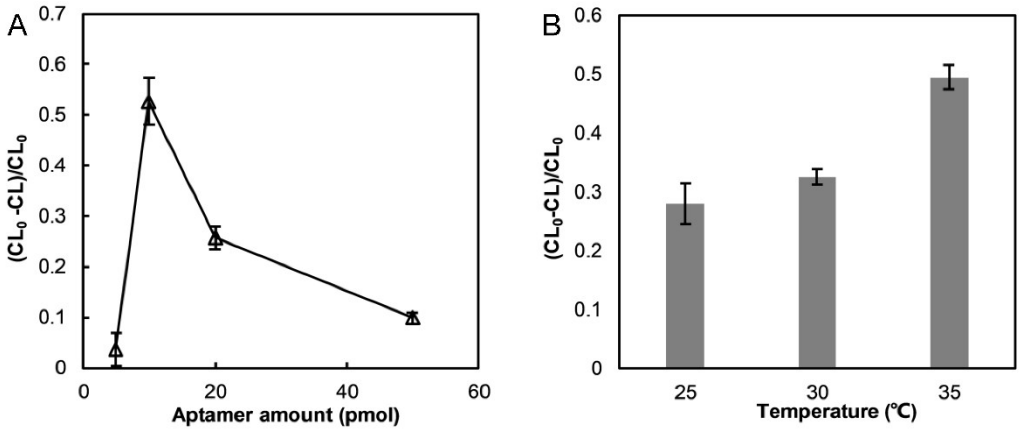

Fig. S3 The effect of aptamer amount (A) and temperature (B) on the detection of ATP. The error bars show the standard deviations for three replicate determinations.

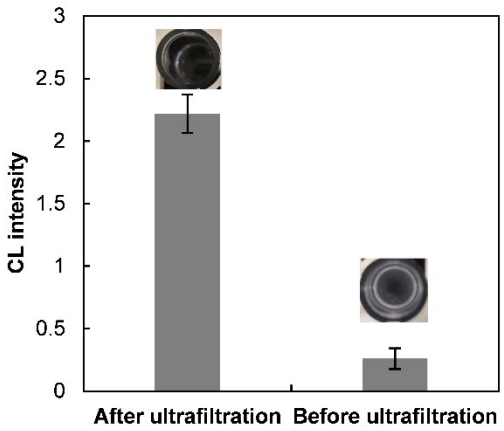

Fig. S4 The matrix effect of human serum on the stability and catalytic activity of cationic liposomes. Inset is the photograph of cationic liposomes mixed with human serum without and with ultrafiltration. The concentration of cationic liposome is 286 μg mL^{-1}.