Electronic Supplementary Material (ESI) for Analyst.

SUPPORTING INFORMATION

Detection of breast cancer-derived exosomes using the horseradish peroxidase-mimicking DNAzyme as aptasensor

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Supporting figures and tables

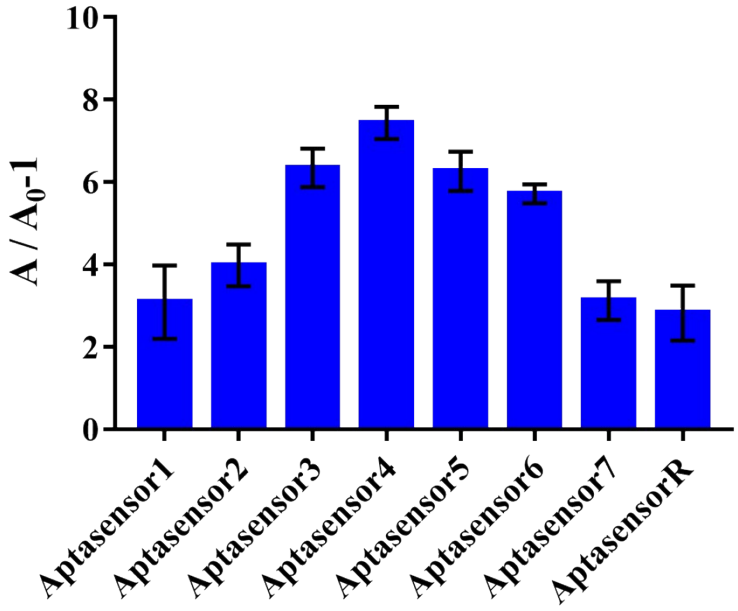

Fig. S1. Optimize the optimal sequence by comparing the relative signal generated from eight DNA probes in our method. A is the absorbance at 420 nm in the presence of exosomes and A_0 is the absorbance at 420 nm in the absence of exosomes. Error bars show the standard deviation of three experiments.

Table S1. Sequences of the hairpin that were used in our expriment.

Name	Sequence(5'→3')
Aptasensor1	**CTGGGAGGGAGGGAGGGAGGTA**AGGGAGATTTGATCCTTTGGATACCTC
Aptasensor2	**CTGGGAGGGAGGGAGGGAGGTA**AGGGAGATTTGATCCTTTGGATACCTCCCT
Aptasensor3	**CTGGGAGGGAGGGAGGGAGGTA**AGGGAGATTTGATCCTTTGGATACCTCCCTCCC
Aptasensor4	**CTGGGAGGGAGGGAGGGAGGTA**AGGGAGATTTGATCCTTTGGATACCTCCCTCCCTCC
Aptasensor5	**CTGGGAGGGAGGGAGGGAGGTA**GATTTGATCCTTTGGATACCTCCCTCCC
Aptasensor6	**CTGGGAGGGAGGGAGGGAGGTA**AGGGAGATTTGATAAGTTGGATACCTCCCTCCC
Aptasensor7	**CTGGGAGGGAGGGAGGGAGGTA**AGGGAGATCCAGCAAGCCTTCTACCTCCCTCCC
AptasensorR	**CTGGGAGGGAGGGAGGGAGGTA**AGGGAGATTTTTTTTTTTTTTTACCTCCCTCCCTCC

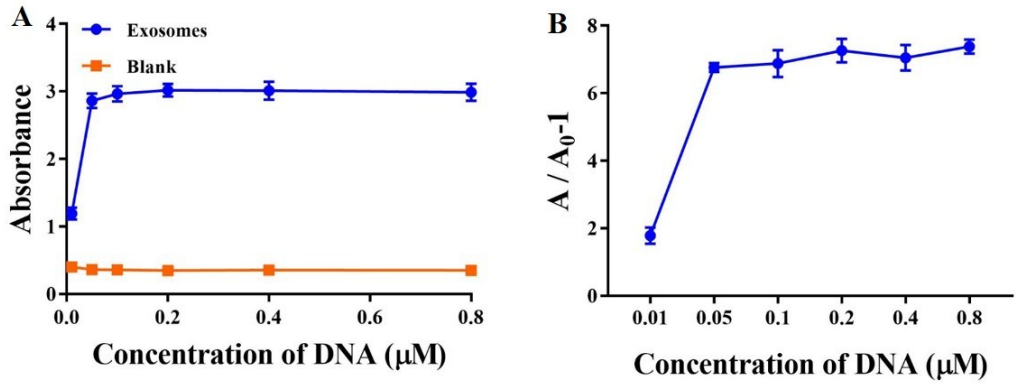

Fig. S2. Optimization of DNA concentration in the reaction system. (A) Different concentration of DNA (0, 0.05, 0.1, 0.2, 0.4, 0.6, 0.8 μM) in the presence and absence of exosomes. (B) The relative signal of different concentration of DNA for detection of MCF-7 exosomes. A is the absorbance at 420 nm in the presence of exosomes and A_0 is the absorbance at 420 nm in the absence of exosomes. Error bars show the standard deviation of three experiments.

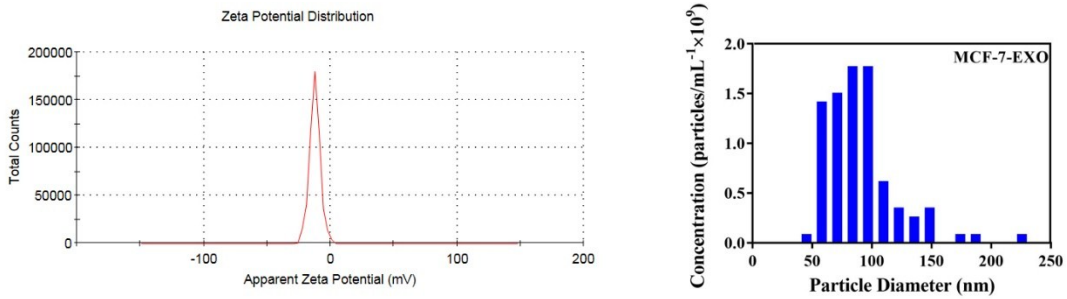

Fig. S3. (A) The zeta potential distribution of the MCF-7 exosomes, around -12.2mV. (B) Size distribution of exosomes measured by qNano.

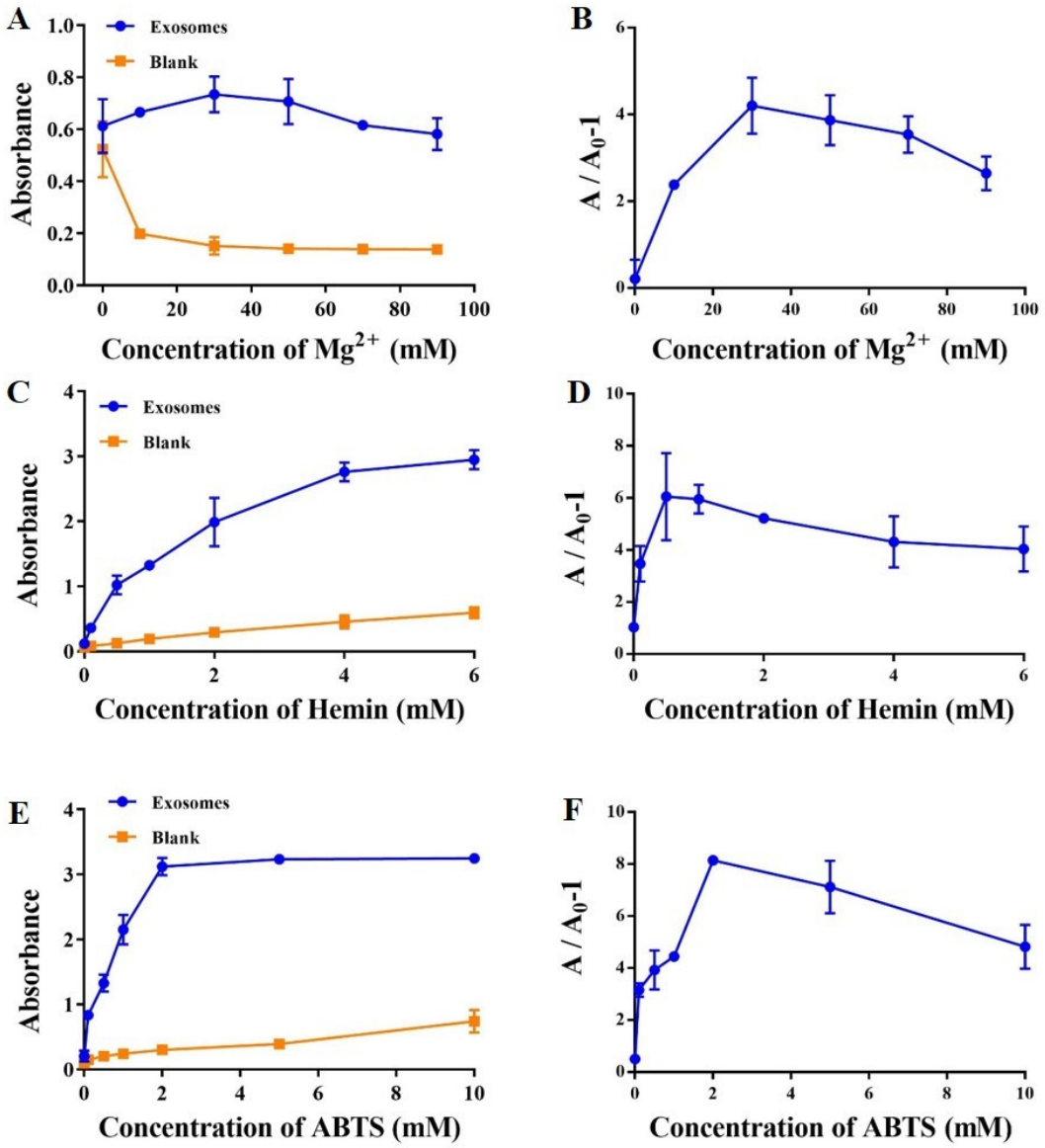

Fig. S4. Optimize the concentration of Mg^{2+}, hemin and ABTS in the reaction system. (A) Different concentration of Mg^{2+} (0, 10, 30, 50, 70, 90 mM) in the presence and absence of exosomes. (B) The relative signal of different concentration of Mg^{2+} for detection of MCF-7 exosomes. (C) Different concentration of Hemin (0, 0.1, 0.5, 1, 2, 4, 6 mM) in the presence and absence of exosomes. (D) The relative signal of different concentration of Hemin for detection of MCF-7 exosomes. (E) Different concentration of ABTS (0, 0.1, 0.5, 1, 2, 5, 10 mM) in the presence and absence of exosomes. (F) The relative signal of different concentration of ABTS for detection of MCF-7 exosomes.

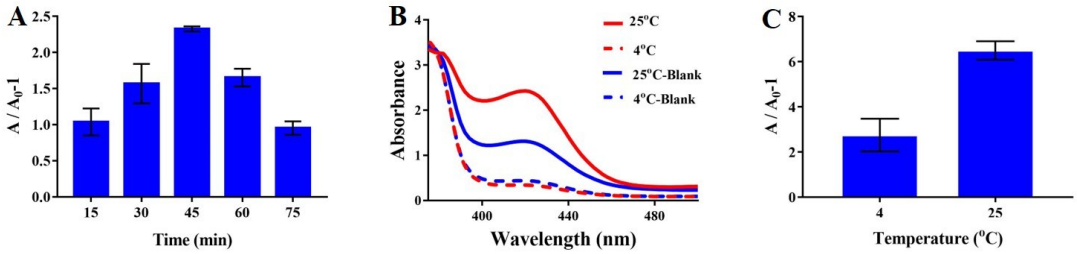

Fig. S5. (A) Influence of incubation time (15, 30, 45, 60, 75 min) and (B) temperature (4, 25℃) on the formation of G-quadruplex. (C) Histogram of absorbance change ratio (A/A_0-1) for the different reaction temperature. A is the absorbance at 420 nm in the presence of exosomes and A_0 is the absorbance at 420 nm in the absence of exosomes. Error bars show the standard deviation of three experiments.

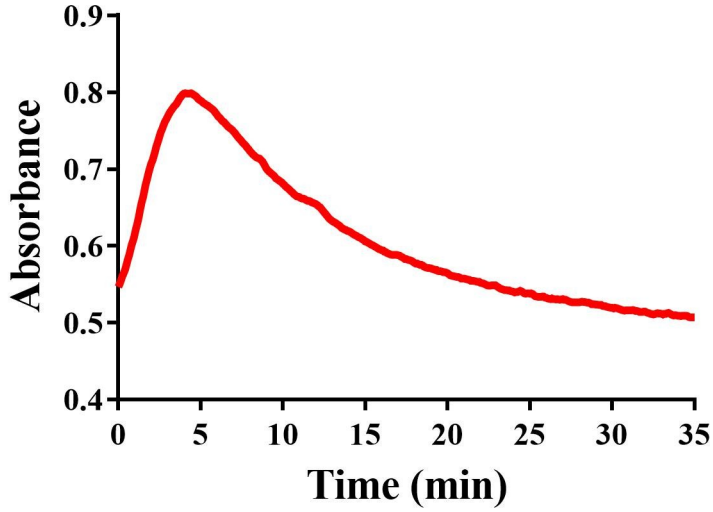

Fig. S6. Absorbance spectral of the reaction system response of the reaction time from 0 to 35 minutes in PBST (pH 7.4) with DNA probe concentration of 50 nM after exosomes were added.