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Supporting Information

Electrochemical detection of tumor cells based on proximity labeling-assisted multiple signal amplification

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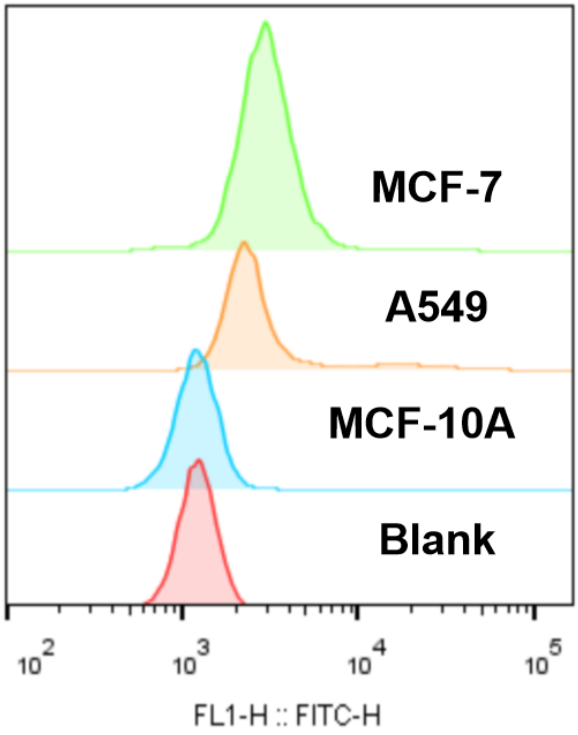

Fig. S1. Flow cytometry to validate cell phenotypes.

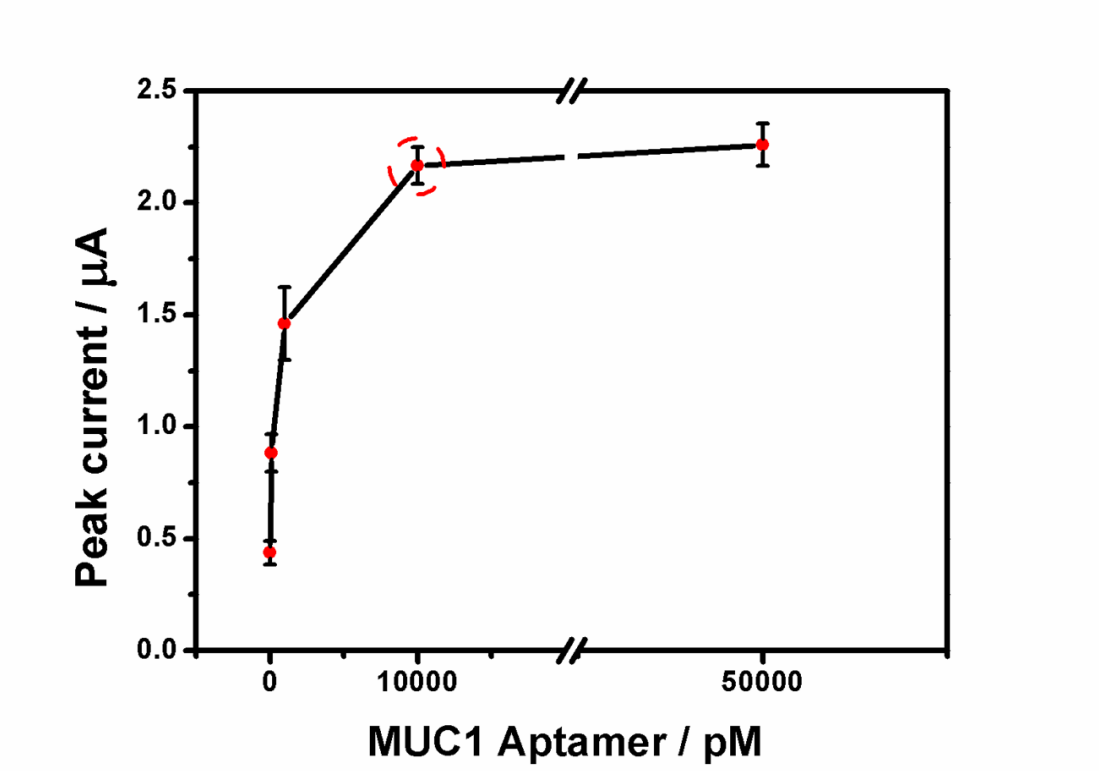

Fig. S2. The optimization of the concentration of MUC-1 aptamers for the functionalization of the gold electrode.

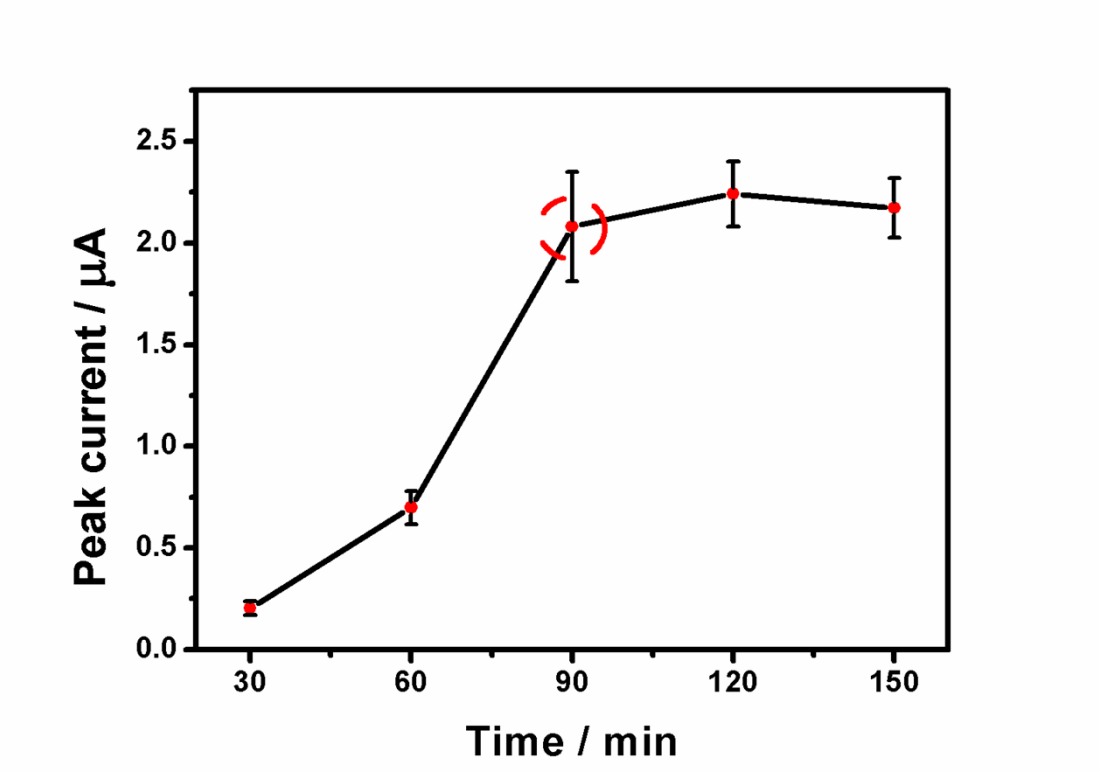

Fig. S3. The optimization of reaction time for the capture of MCF-7 cells at MUC-1 aptamer-functionalized electrodes.

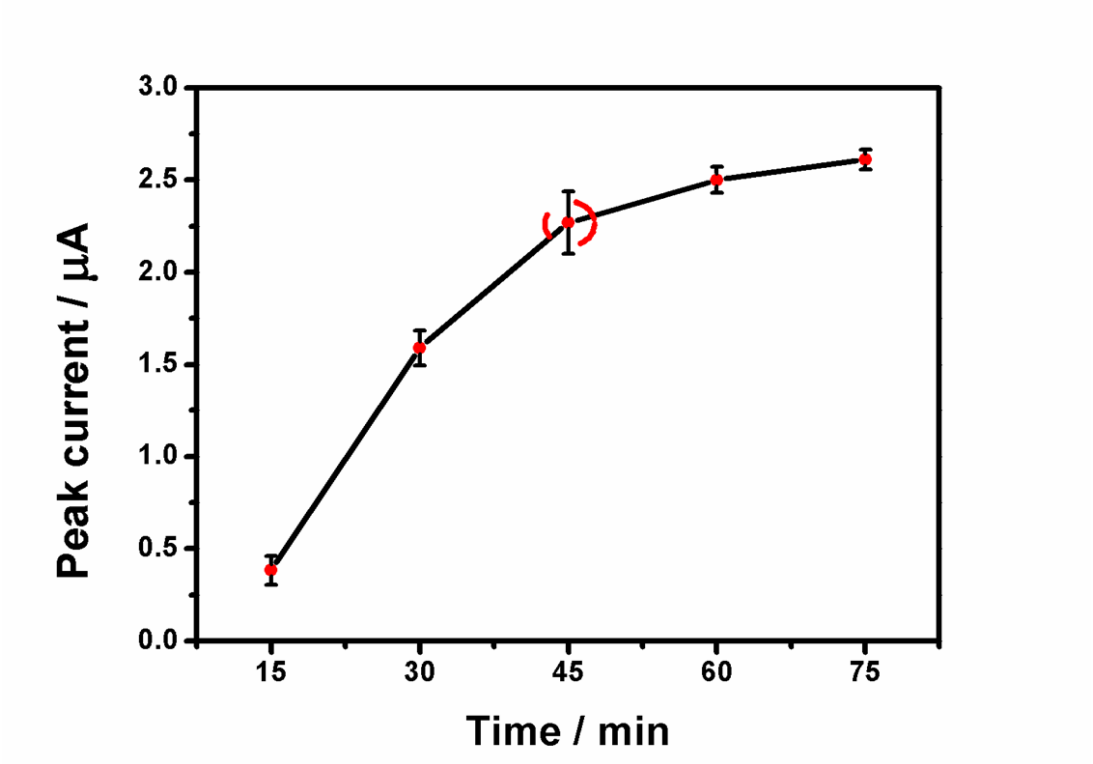

Fig. S4. The optimization of reaction time for the linking of G4-DNA strands.

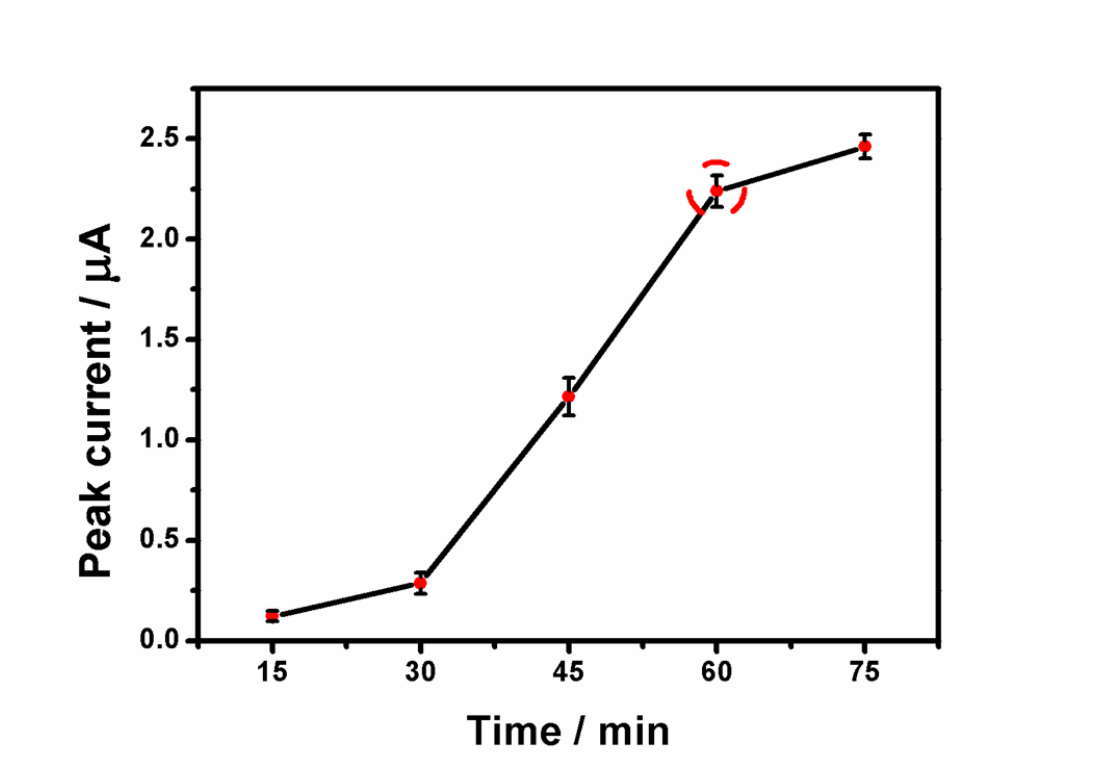

Fig. S5. The optimization of reaction time for the deposition of Ty-AuNPs.

Table S1. Sequences of G4-DNA and MUC-1 aptamer used in this work.

Sample	Name	Sequence (5’-3’)	Modified
1	SH-MUC-1 Aptamer	GCAGTTGATCCTTTGGATACCCTGG	5’SH
2	Mal-G4-DNA	TTTTTCATATAGGATGGGATGGGCGGGTT GGGA	5’Maleimide

Table S2. Comparison of currently available methods for tumor cells detection.

Method	Linear range	Detection limit	Ref
Electrochemiluminescence method based on Co^{2+} doped TiO_2 nanodisks	2.6×10^2 to 2.6×10^6 cells/mL	100 cells/mL	S1
Electrochemical method based on dendrimer-Au nanoparticle network covered aluminum oxide	3×10^2 to 1×10^3 cells/mL	80 cells/mL	S2
Chemiluminescence method based on a handheld luminometer	1×10^2 to 5×10^4 cells/mL	85 cells/mL	S3
Flow cytometry method based on a split aptamer-triggered dual hybridization chain reaction	1×10^2 to 5×10^6 cells/mL	100 cells/mL	S4
Fluorescent method using gold nanocluster-based aptasensor	2.5×10^2 to 2×10^4 cells/mL	221 cells/mL	S5
Electrochemical method based on proximity labelling-assisted multiple signal amplification	1×10^2 to 1×10^6 cells/mL	21 cells/mL	This work

Supporting References

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Table S3. Electrochemical detection of MCF-7 cells in diluted serum samples.

Sample	Added concentration (cells/ml)	Detected concentration (cells/ml)	Recovery (%)
1	1000	912	91.20
2	10000	9333	93.33
3	100000	95499	95.50