A Double-Tetrahedral DNA Framework Based Electrochemical Biosensor for Ultrasensitive Detection and Release of Circulating Tumor Cells

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Table S1. Sequences for oligonucleotide used in this work.

Name	Sequence (5′-3′)
A	ACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAGAGCCGCCATAGTATTTTTTTTTTTCAACATCAGTCTGATAAGC
B	SH-C6-TATCACCAGGCAGTTGACAGTGTAGCAAGCTGTAATAGATGCGAGGGTCCAATAC
C	SH-C6-TCAACTGCCTGGTGATAAAACGACACTACGTGGGAATCTACTATGGCGGCTCTTC
D	SH-C6-TTCAGACTTAGGAATGTGCTTCCCACGTAGTGTCGTTTGTATTGGACCCTCGCAT
a	ACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAGAGCCGCCATAGTATTTTTTTTTTGCTTATCAGACTGATGTTGA
b	TATCACCAGGCAGTTGACAGTGTAGCAAGCTGTAATAGATGCGAGGGTCCAATACCTGACCACGAGCTCCATTAC
c	TCAACTGCCTGGTGATAAAACGACACTACGTGGGAATCTACTATGGCGGCTCTTCCTGACCACGAGCTCCATTAC
d	TTCAGACTTAGGAATGTGCTTCCCACGTAGTGTCGTTTGTATTGGACCCTCGCATCTGACCACGAGCTCCATTAC
SYL3C-aptamer	biotin-CACTACAGAGGTTGCGTCTGTCCCACGTTGTCATGGGGGGTTGGCCTGTTTTTGTAATGGAGCTCGTGGTCAG-biotin
SYL3C-aptamer-Cy3	Cy3-CACTACAGAGGTTGCGTCTGTCCCACGTTGTCATGGGGGGTTGGCCTGTTTTTGTAATGGAGCTCGTGGTCAG-Cy3
Single aptamer	biotin-

	CACTACAGAGGTTGCGTCTGTCCCACGTTGTCATGGGGGGTTGGCCTGTTTTTGCTTATCAGACT GATGTTGA-biotin
E	SH-C6-ACATTCCTAAGTCTGAAACATTTTTTTTTTTCAACATCAGTCTGATAAGC

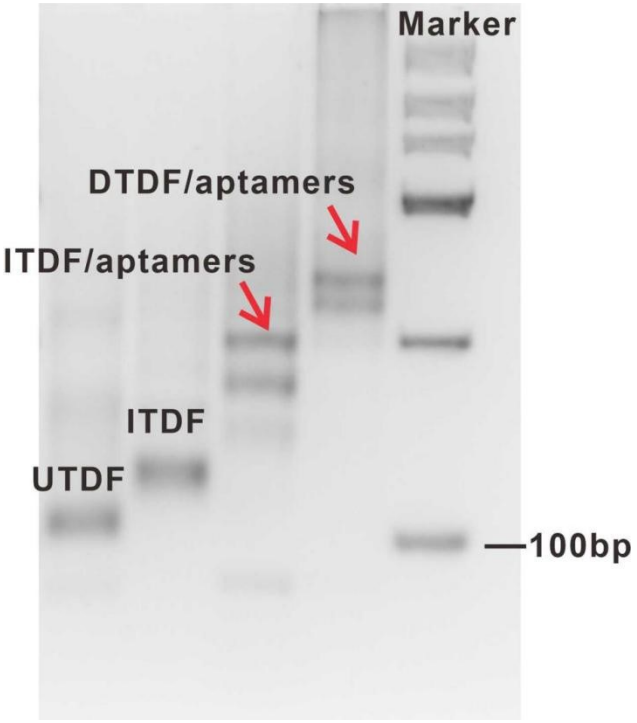

Fig.S1 Agarose gels image of DNA tetrahedral nanostructures. From left to right: upright tetrahedral DNA framework (UTDF); inverted tetrahedral DNA framework (ITDF); complex of ITDF couple with aptamers (ITDF/aptamers); UTDF hybrid with ITDF/aptamers (DTDF/aptamers); 100bp marker.

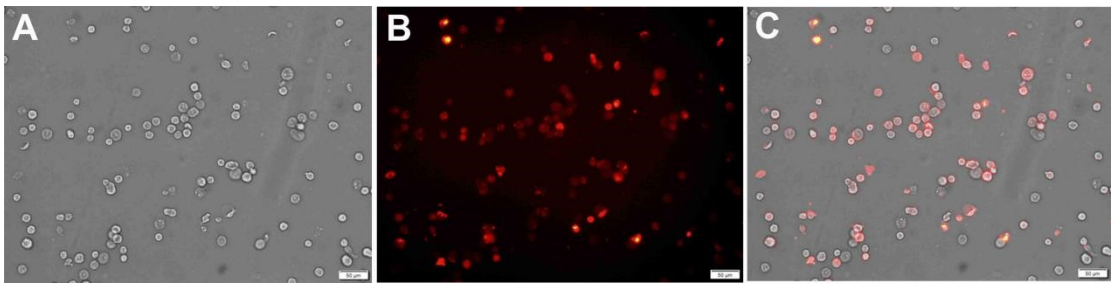

Fig.S2 Fluorescence microscope image of (A) bright field of MCF-7 cells (B) Cy3 modified UTDFs/aptamers probes and (C) merged picture. Scale bar=50μm.

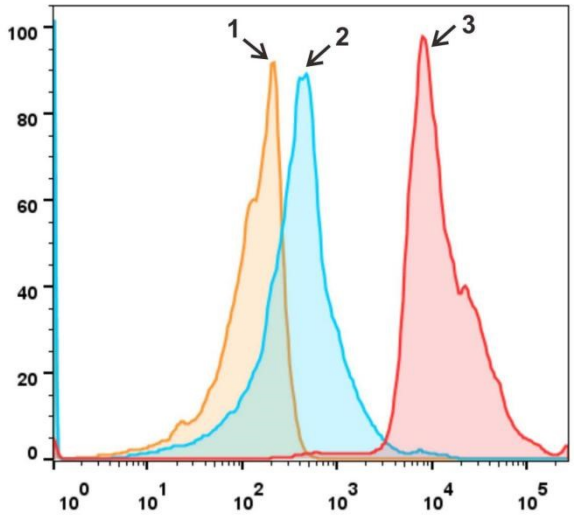

Fig.S3 Flow cytometry analysis for (1) MCF-7 cells, (2) Cy3 labeled ITDF/libs/MCF-7 cells and (3) Cy3 labeled ITDFs/aptamers/MCF-7 cells.

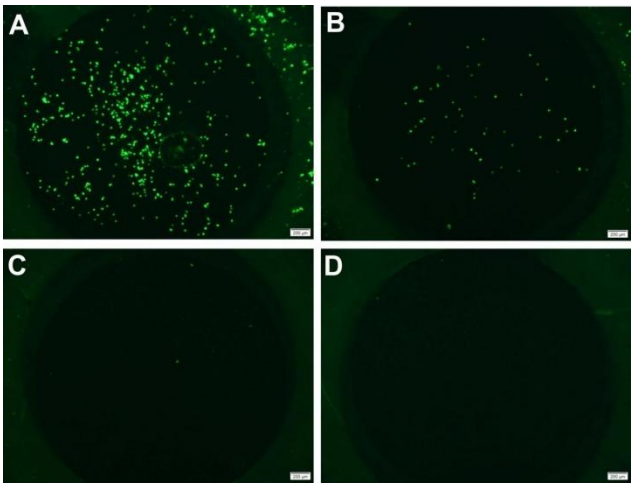

Fig.S4 Fluorescence microscope images of unreleased MCF-7 cells on the electrode under different digestion times of benzonase nuclease. (A) 0min, (B) 5min, (C) 10min, (D) 20min. Scale bar=200μm.

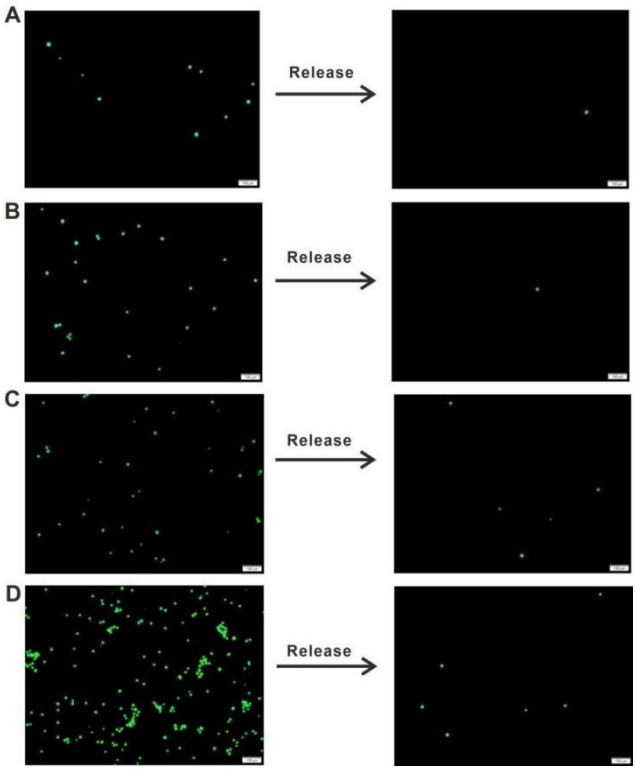

Fig.S5 (A-D) Fluorescence microscope images of MCF-7 cells (100, 500, 1000 and 5000) captured and released on the surface of E-CTC sensor system. Scale bar=100 μm.

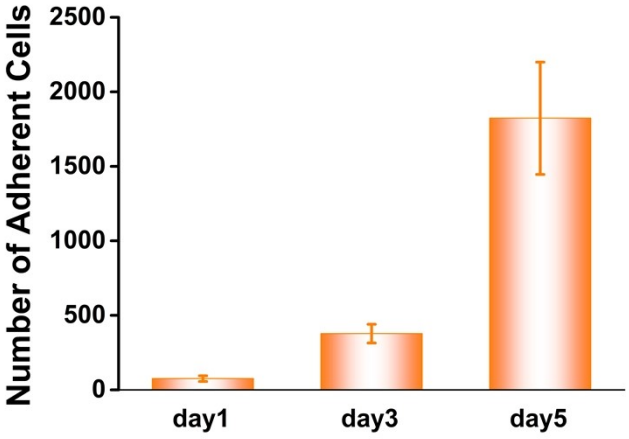

Fig.S6 The number of adherent MCF-7 cells after different recultured time (1, 3, 5 days).