



Tetrahedral DNA Framework-Programmed Electrochemical Biosensors with Gold Nanoparticles for Ultrasensitive Cell-Free DNA Detection

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Table S1. Sequences for oligonucleotide used in this work.

Name	Sequence (5'-3')
A-7-capture	GAGCGTTAGCCACACACAGTCTTTTTTTTTT GATTTTCTTCCTTTTGTTTC
B-7	SH-C6-TTAGGCGAGTGTGGCAGAGGTGT
C-7	SH-C6-CGCCTAAACAAGTGGAGACTGTG
D-7	SH-C6-AACGCTCACCACCTGAACACCTC
A-17-capture	ACATTCCTAAGTCTGAAACATTACAGCTTGCTACACGAGAAGAGCCGCCATAGTATTTTTTTTTT GATTTTCTTCCTTTTGTTTC
B-17	SH-C6-TATCACCAGGCAGTTGACAGTGTAGCAAGCTGTAATAGATGCGAGGGTCCAATAC
C-17	SH-C6-TCAACTGCCTGGTGATAAAACGACACTACGTGGGAATCTACTATGGCGGCTCTTC
D-17	SH-C6-TTCAGACTTAGGAATGTGCTTCCACGTAAGTGTGCTTTGTATTGGACCCTCGCAT
A-26-capture	GCCTGGAGATACATGCACATTACGGCTTTCCCTATTAGAAGGTCTCAGGTGCGCGTTTCGGTAAGTAGACGGGACCAGTTCGCCATTTTTTTTTTGATTTTCTTCCTTTTGTTTC
B-26	SH-C6-CGCGCACCTGAGACCTTCTAATAGGGTTTGGCAGAGTCGTTCAACTAGAAATGCCCTTTGGGCTGTTCCGGGTGTGGCTCGTCGG
C-26	SH-C6-GGCCGAGGACTCCTGCTCCGCTGCGGTTTGGCGAACTGGTCCCGTCTACTTACCGTTTCCGACGAGCCACACCCGGAACAGCCC
D-26	SH-C6-GCCGTAATGTGCATGTATCTCCAGGCTTTCCGCAGCGGAGCAGGAGTCCTCGGCCTTTGGGCATTCTAGTTGAACGACTGTGCG
Single capturer	SH-C6-GAGCGTTAGCTTTTTTTTTT GATTTTCTTCCTTTTGTTTC
Target-BRCA-1	TGGTAACAGTGTGAGGTTTAACGGAACAAAAGGAAGAAAATC
BRCA-1-biotin	Biotin- GAACAAAAGGAAGAAAATC
H1-biotin	Biotin- CGTTAAACCTCACACTGTTACCAAGTTTGTGGTAACAGTGTGAGGT
H2-biotin	Biotin- TGGTAACAGTGTGAGGTTTAACGACCTCACACTGTTACCACAACT

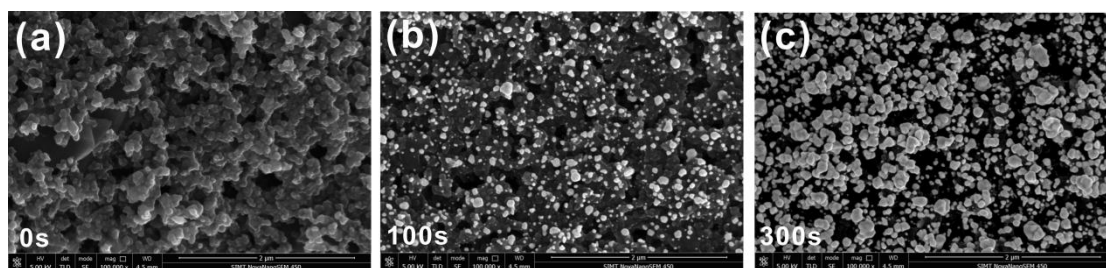


Figure S1. The SEM images of the bare SPCE (a) and SPGE with different deposition time: 100 s (b), 300 s (c). The scale value was 2 μm.

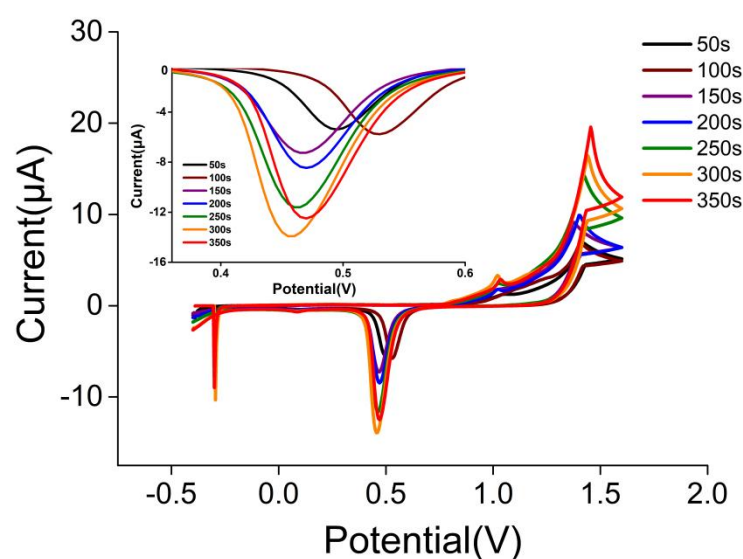


Figure S2. Investigation on the deposition time of HAuCl₄. The integral CVs results recorded for the Au NPs modified 16-SPCE in 0.5 M H₂SO₄, scan rate: 100 mV/s.

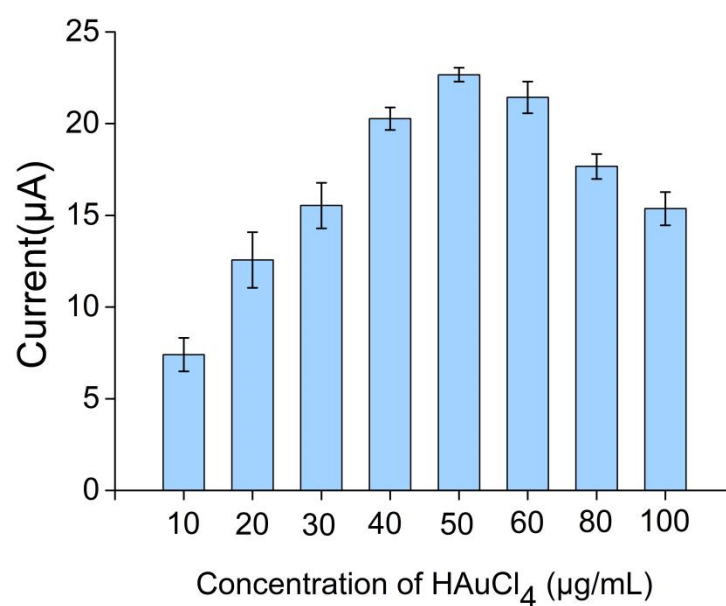


Figure S3. Investigation on the concentration of HAuCl₄. CVs results responded for 10, 20, 30, 40, 50, 60, 80, 100 μg/mL HAuCl₄ solution. The Au NPs modified 16-SPCE was scanned in 0.5 M H₂SO₄.

The electrodeposition time was 300 s. Error bars represented the SD of at least 3 independent experiments.

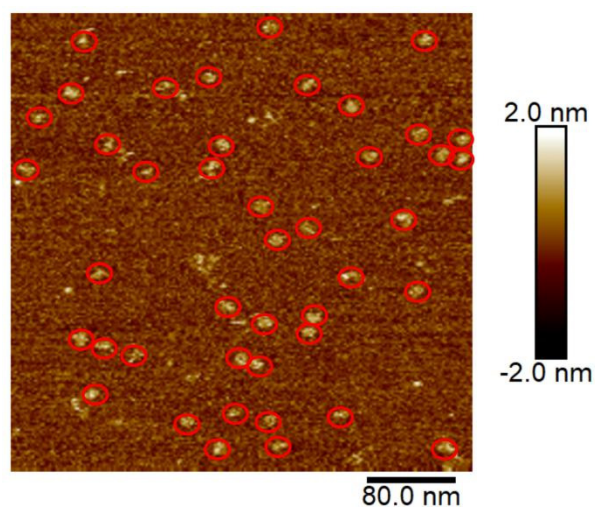


Figure S4. The structure characterization of TDF-17 by AFM. The average edge length of the TDF-17 measured was about 6.194 nm, which was close to the theoretical value (5.8 nm). Scale bar = 80nm.

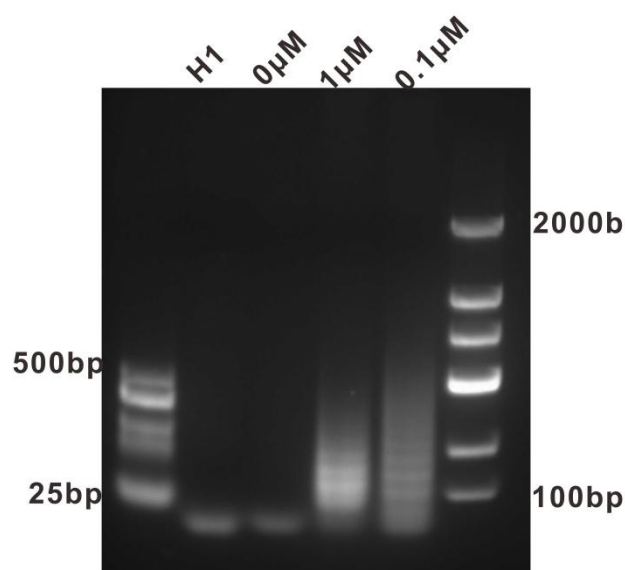


Figure S5. Agarose gel electrophoresis image analysis for HCR. From left to right, lane1 and lane6, 20-bp and 2000-bp DNA ladder markers, respectively; Lane2, H1; Lane3, H1 + H2, without initiator; Lane4, H1 + H2 + initiator (1 μ M); Lane5, H1+H2+initiator (0.1 μ M).

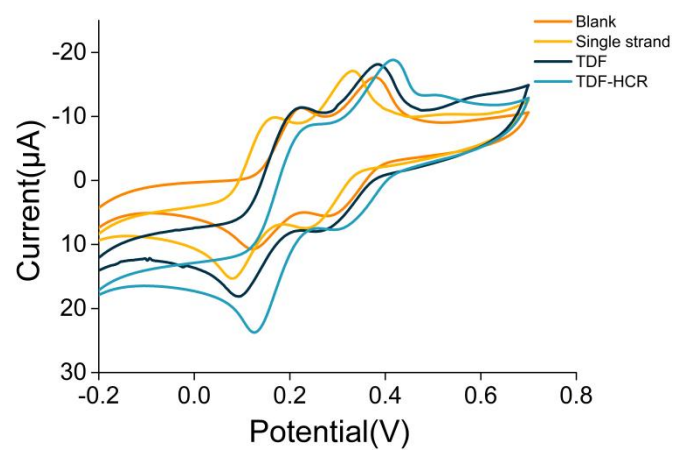


Figure S6. Typical CV curves for different probes modified on SPGE at target concentration of 1 nM. It conducted at a scanning rate of 0.1 V/s ranging from −0.3 V to 0.7 V.