

**Electronic Supplementary Information**

**Ultrasensitive electrochemical detection of dual DNA  
targets based on G-quadruplex-mediated  
amplification**

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## **Experimental**

### **Influence of the location of targets on the sensitivity**

Sequences of oligonucleotides used:

Capture DNA (Cap-DNA): 5'-ATGTATAGATTTTCGGG-(CH<sub>2</sub>)<sub>6</sub>-SH-3'

Target DNA 1 (T1): 5'-TATACATAACC-3'

Target DNA 2 (T2): 5'-CCCGAAATC-3'

Signal DNA (Sig-DNA): 5'-GGGTAGGGCGGGTTGGG-3'

Template-DNA (Tem-DNA): 5'-CCCTACCCGGTTATGTATAGATTTTCGGG-3'

The same procedure was carried out to detect the targets as described in the main manuscript.

### **Verification of the versatility of the sensor**

Sequences of oligonucleotides used:

Capture DNA (Cap-DNA): 5'-GTATACGGTTGACGCAGACGTCCAAAGAGGTA  
AAACATGCGCCAGTAAAAA-(CH<sub>2</sub>)<sub>6</sub>-SH-3'

Target DNA 3 (T3): 5'-TTTTTACTGGCGCATGTTTTACCTCTTTGGACG-3'

Target DNA 4 (T4): 5'-ACCAAGTCATCTGCGTCAACCGTATAC-3'

Signal DNA (Sig-DNA): 5'-GGGTAGGGCGGGTTGGG-3'

Template-DNA (Tem-DNA): 5'-  
CCCTACCCGTATACGGTTGACGCAGATGACTT GGTCGTCCAAAGAGGTAA  
AACATGCGCCAGTAAAAA-3'

Single-base mismatched sequence of T3 (M31): 5'-TTTTTACTGGCGCATGTTTA

CCTCTTTGGACA-3'

Three-base mismatched sequence of T3 (M33): 5'-TTTTTACTGGCGCATGTTTTA

CCTCTTTGGGTA-3'

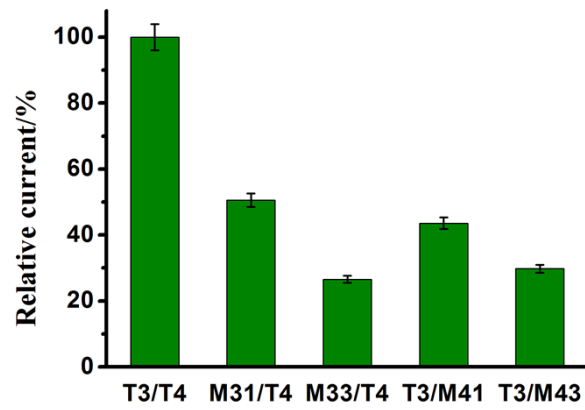
Single-base mismatched sequence of T4 (M41): 5'-ACCAAGTCATCTGCGTCAAC

CGTATA-3'

Three-base mismatched sequence of T4 (M43): 5'-ACCAAGTCATCTGCGTCAAC

CGTACGT-3'

The same procedure was carried out to detect T3 and T4 and verify the specificity as described in the main manuscript.



**Fig. S1.** The current changes of the DNA sensor in the presence of T3 and T4, or mismatched sequences of T3 and T4. The concentration of all the oligonucleotides set as 0.5  $\mu$ M. The error bars are from three independent determinations.