Supporting Information for

Simple, Label-free, Electrochemical DNA Parity Generator/Checker for Error Detection during Data Transmission Based on "Aptamer-Nanoclaw"-modulated Protein Steric Hindrance

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Table S1. Sequences of DNA used in this work.

Strands	Sequences (5' to 3')
S	*SH*-ATTCGTCAGTTTCGTATCACGTTTCTGTGCAAT
Ca	GGTTGGTGTGGTTGG ATATTACGATGAAGCAAAACGTTAGACGAAACTATATAAT
Cb	GGTTGGTGTGGTTGG ATTATATAGAAACGTCTAACGAAATGCTTCATCGTAATAT
TCb	GGTTGGTGTGGTTGG ATTATATAGAAACGTCTAACGAAATGCTTCATCGTAATAT TTTTT
T20	TTTTT TTTTT TTTTT TTTTT
T30	TTTTT TTTTT TTTTT TTTTT TTTTT TTTTT
T40	TTTTT TTTTT TTTTT TTTTT TTTTT TTTTT TTTTT TTTTT

For the detailed DNA hybridization of strands S, Ca, Cb, their different reactions were simulated on the website: http://unafold.rna.albany.edu/?q=DINAMelt/Two-state-melting, and the parameters during simulation were used as default. The TBA15 "nanoclaw" parts were noted with red frameworks, and the names with different colors represented the three strands (the colors were consistent with **Table S1**.)

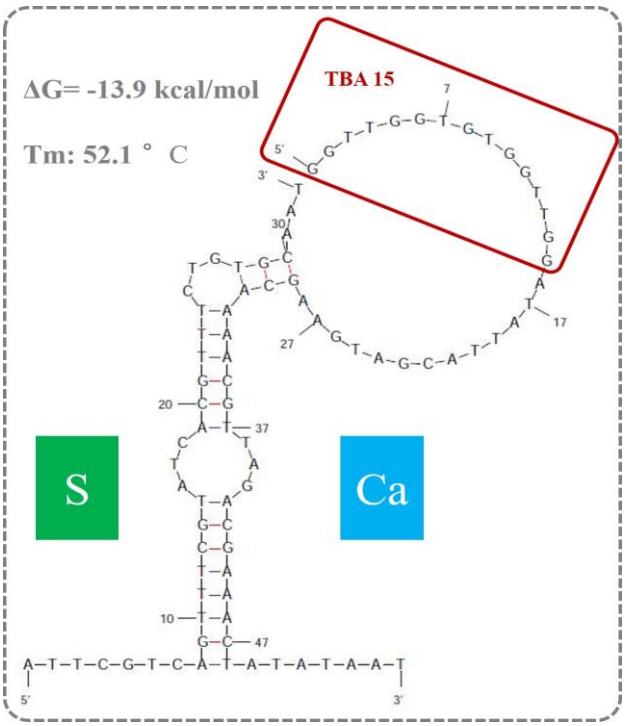

Figure S1. Schematic diagram of the hybridization between strand S and Ca.

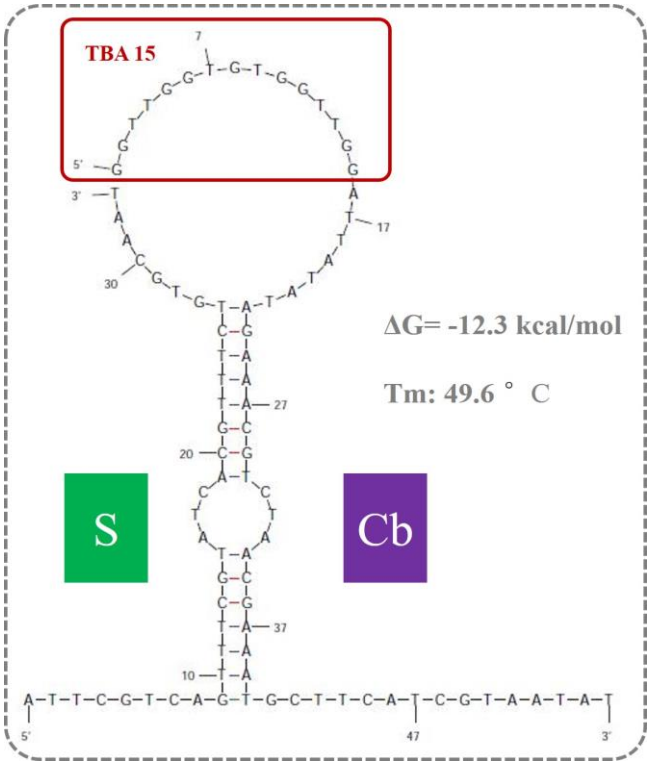

Figure S2. Schematic diagram of the hybridization between strand S and Cb.

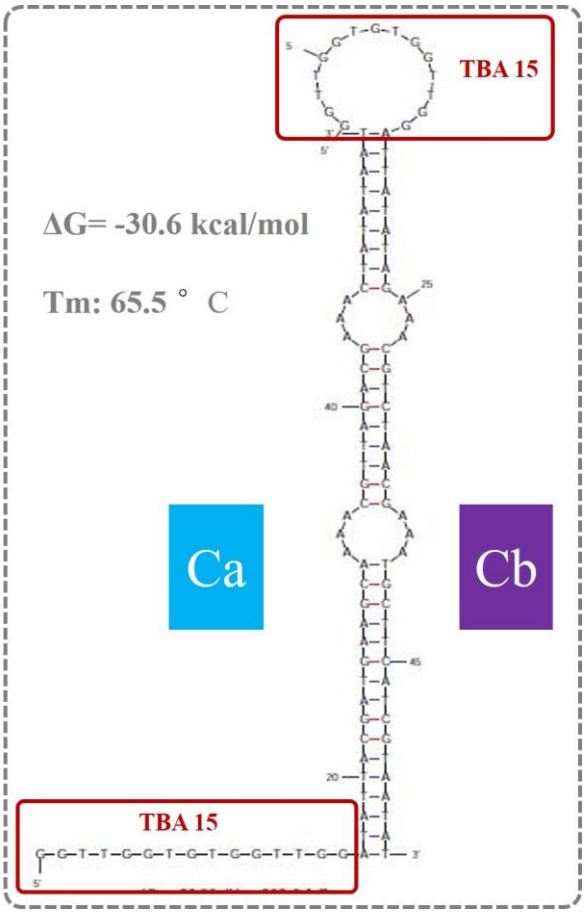

Figure S3. Schematic diagram of the hybridization between strand Ca and Cb.

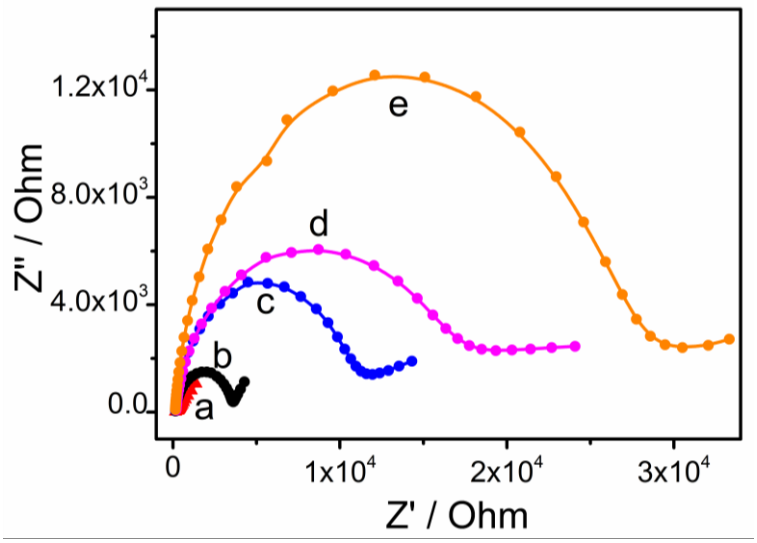

Figure S4. Electrochemical impedance spectra (Nyquist curves) for characterizing the modification of Ca/S on electrode, **(a)** bare Au electrode, **(b)** S/Au, **(c)** MCH/S/Au, **(d)** TB/R/MCH/S/Au and **(e)** TB/Ca/MCH/S/Au.

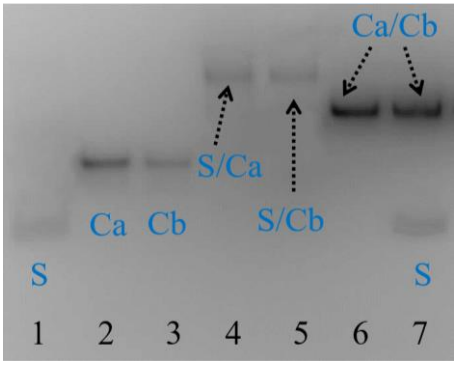

Figure S5. Native polyacrylamide gel electrophoresis (PAGE) analysis of the interactions between strands S, Ca, and Cb. For different channels: (1) S; (2) Ca; (3) Cb; (4) S+Ca; (5) S+Cb; (6) Ca+Cb; (7) S+Ca+Cb, strands Ca and Cb were pre-hybridized before reacting with S. The S/Ca represented the duplex, *others ditto*.

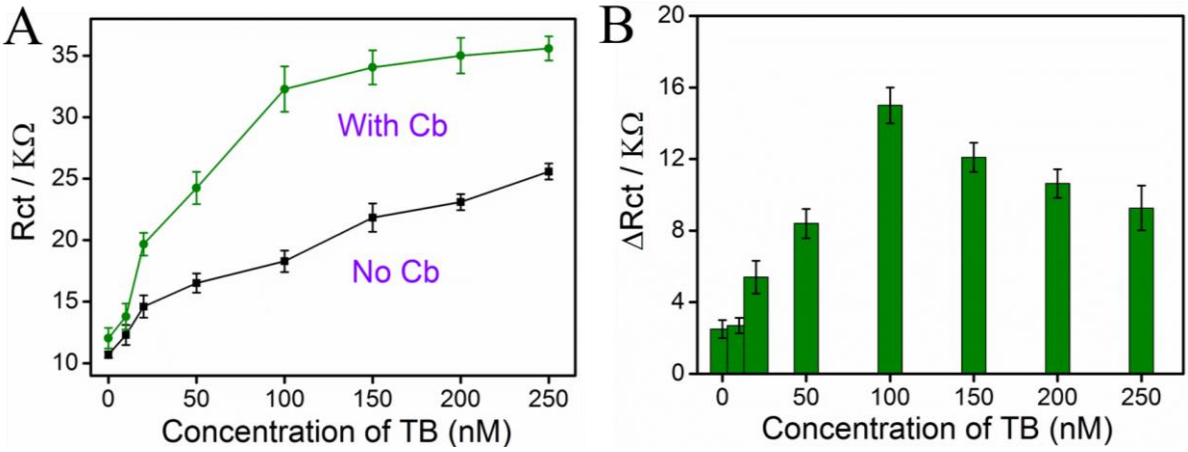

Figure S6. Optimization of the concentration ratio of TB used in this work. For **(B)**, the ΔRct=Rct (With Cb)-Rct (No Cb). As can be seen, the S/N ratio reached a highest value in the presence of 100 nM TB.

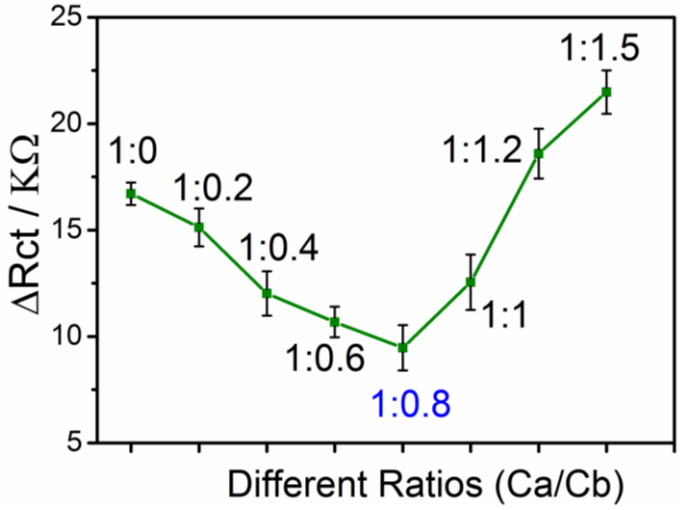

Figure S7. Optimization of the concentration ratio of strand Ca and Cb for their coexistence. ΔRct=Rct (a)-Rct (i), in which Rct (i) and Rct (a) represents the Rct of initial platform and that after adding inputs/TB, respectively. The ratio of 1: 0.8 for C(Ca): C(Cb) was applied to obtain the lowest background.