Supporting information

Single-step and ultrasensitive detection of carcinoembryonic antigen based on aptamer-transduction mediated exonuclease III-assisted dual-amplification strategy

Ruojun Lu,[a] Shengqiang Li,[a] Meihong Fan,[a] Jingjing Wei,[a] Xu Liu[a]*

[a] First Teaching Hospital of Tianjin University of Traditional Chinese Medicine, Tianjin 300020, China

Table S1. Sequences from 5' to 3'-terminal of oligonucleotides used in this work

DNA	Sequence from 5' to 3'-terminal
H1	GAATAAGCTGGCATACCAGCTTATTCAATTCA
H2	AAGCTGGTTTATCACTACCTCTCTATTACACAAGCTGGTAGTGATAA ACCAGCTTATTC
FS	FAM-TAGTGATAAA-BHQ1

Table S2. Comparison of different amplification approaches for CEA detection

Technique	Approach[a]	Dynamic range (ng mL^{-1})	LOD (pg mL^{-1})	Ref.
Fluorescence	Exo III-DNA walker	0.01-100	1.2	1
Electrochemistry	PLA-RCA	0.001-10	0.49	2
Electrochemistry	PLA -MNAzyme	0.002-500	1.5	3
Electrochemistry	Nanocomposite	0.05-40	10	4
Electrochemistry	PtPd/N-GQDs@Au	0.000005-50	0.002	5
Fluorescence	Exo III assisted dual-amplification	0.0001-10	0.058	This work

[a] PLA, proximity ligation assay; RCA, rolling circle amplification; PtPd/N-GQDs@Au, nitrogen-doped graphene quantum dots supported PtPd bimetallic functionalized Au nanoparticles.

1 M. Q. He, K. Wang, W. J. Wang, Y. L. Yu and J. H. Wang, *Anal. Chem.*, 2017, **89**, 9292-9298.

2 F. L. Gao, F. Y. Zhou, S. J. Chen, Y. Yao, J. Wu, D. Y. Yin, D. Q. Geng and P. Wang, *Analyst.*, 2017,**142**, 4308-4316.

3 K. W. Ren, J. Wu, H. X. Ju and F. Yan, *Anal. Chem.*, 2015, **87**, 1694-1700.

4 T. Yang, Y. Gao, Z. Liu, J. Xu, L. Lu and Y. Yu, *Sens. Actuator B-Chem.*, 2017, **239**, 76-84.

5 Y. Y. Yang, Q. Liu, Y. Liu, J. J. Cui, H. Liu, P. Wang, Y. Y. Li, L. Chen, Z. D. Zhao and Y. H. Dong, *Biosens. Bioelectron.*, 2017, **90**, 31-38.