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Supporting Information for:

Dual-readout aptasensing of antibiotic residue based on gold nanoclusters-functionalized MnO_2 nanosheets with target-induced etching reaction

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S1. Partial experimental section

S1.1. Chemical and reagent

Kanamycin (Kana), chloramphenicol (CAP), amikacin (AMK), gentamicin (GEN), tobramycin (TOB) and norfloxacin (NOR) were purchased from Aladdin (Shanghai, China). Exonuclease I (Exo I) and all the oligonucleotides were synthesized and purified by Sango Biotech. Co., Ltd. (Shanghai, China). Table S1 provides the sequences of all DNA used. $HAuCl_4$, the carboxylated magnetic bead (MB; 100 nm in diameter), streptavidin-alkaline phosphatase conjugate (SA-ALP) and $Mn(NO_3)_2$ were purchased from Sinopharm Chem. Re. Co., Ltd. (Shanghai, China). *N*-(3-dimethylaminopropyl)-*N'*-ethyl-carbodiimide hydrochloride (EDC), bovine serum albumin (BSA; Vetec^{TM}, reagent grade, ≥98%) and *N*-hydroxysuccinimide (NHS) were gotten from Sigma (St. Louis, USA). All other chemicals were of analytical grade and used as received. Ultrapure water obtained from a Millipore water purification system at 18.2 $M\Omega \cdot cm^{-1}$ (Milli-Q, Millipore) was used throughout this work. Phosphate buffer solution (PBS) with different pH values was prepared by using 10 mM phosphate-buffered saline and 0.1 M KCl.

Table S1 DNA sequences used in this study

Name	Sequence (5'- 3')
Aptamer for Kana (Apt)	TGGGGGTTGAGGCTAAGCCGA
Complementary DNA (C-DNA)	TCGGCTTAGCCTCAACCCCCAGGGGTTTTATGCAAAACCCC
Hairpin DNA1 (HP1)	NH_2-$(T)_{10}$-TGGGGGTTGAGGAAA AACCTCAACC
Auxiliary DNA probe	CACCCGACTTAGGTTGAGGTTTTTCTAAGCCGACCCACACCCGA
Biotin-hairpin H1 (Bio-H1)	Biotin-CACCCGACTTATCGGGTGTGGG
Biotin-hairpin H2 (Bio-H2)	TAAGTCGGGTGCCCACACCCGA-Biotin

Note: Before reaction, all of hairpin probe were annealed at 95 °C for 5 min and slowly cooled down to room temperature.

Table S2 Comparison of different assay methods for Kana determination on the analytical properties

Methods	Linear range	Detection limit	Analysis time	Ref.
Photoelectrochemistry	0.2 – 450 nM	50 pM	43 h	[1]
Luminescence	0.2 – 150 μM	143 nM	2 h	[2]
Colorimetric assay	0.1 – 100 nM	0.1 nM	3 h	[3]
Fluorescence resonance energy transfer	1.0 – 50 nM	0.4 nM	5 h	[4]
Lateral flow test strip	1.0 – 30 nM	77.8 pM	30 h	[5]
Electrochemical aptasensor	2.1 – 128.7 nM	188.8 pM	8 h	[6]
Fluorescence aptasensor	0.002 – 5 nM	1.2 pM	5 h	This work

References

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