

Electronic Supplementary Information

**Ultrasensitive detection of H5N1 by ICP-MS with DNA dendrimer-
carried silver nanoparticles labeling**

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Table S1 Sequences of oligonucleotides (5'-3') used in this study. The underlined letters represent mismatched bases.

Name	Sequences (5'- 3')
dsDNA1-a	Biotin-TTTTTTTTTTTTTTTAGACTCTTGAGTTCTCAGTATGTCGGT GTCTGCCTGTGTGCCTATTATGTCTCTGCCTGTGTGCCTATTATGTC
dsDNA1-b	GACATAATAGGCACACGACATAATAGGCACACCACCGACATACT GAGAAC
ssDNA1	AGTATGTCGGTGTGTGCCTATTATGTCTGTGCCTATTATG
dsDNA2-a	Biotin-TTTTTTTTTTTTTTCACCGACATACTGAGAACTCAAGAGGAC ATAATAGGCACACAGGCA
dsDNA2-b	GTGTGCCTATTATGTTCGTTCTCAGTATGTCGGTG
ssDNA2	CCGACATACTGAGAACGACATAA
H5N1 nucleic acid fragment	CATACTGAGAACTCAAGAGTCT
Mismatch-1	CATACTGAGAACTCAAGAGT <u>TT</u>
Mismatch-3	CATACTGAGAACTCAAGAT <u>TATT</u>
Mismatch-5	CATACTGAGAACTCAAT <u>TTTATT</u>
Mismatch-7	CATACTGAGAACTC <u>TTTTTATT</u>

Table S2 Operating parameters of ICP-MS with a Babington nebulizer

ICP-MS plasma	Parameters
Rf power	1550W
Plasma gas flow(Ar)	14 L min ⁻¹
Auxiliary gas flow(Ar)	0.80 L min ⁻¹
Nebulizer gas flow(Ar)	0.97 L min ⁻¹
Sampling depth	5.0 mm
Sampler/skimmer diameter orifice	Nickel 0.8 mm 0.4 mm ⁻¹
Scanning mode.	Peak-jumping
Dwell time	20ms
Integration mode	Peak area
Monitored isotope	¹¹¹ Cd, ¹⁰⁷ Ag

Table S3 Comparison of this method with other methods for detection of nucleic acids.

Method	Linear range (nM)	LOD (nM)	Ref.
MNAzyme-catalyzed amplification assay	0.05-1.0	0.02	[22]
DNA templated silver nanoclusters fluorescent probe based assay	5.0-100	0.29	[23]
Assay based on DNA-silver nanocluster probe	20-1800	18	[24]
One-step fast and label-free imaging array	0.5-25	0.14	[25]
Three-Segment Branched DNA-Templated Fluorescent Silver Nanoclusters based assay	0.5-2000	0.5	[26]
Multifunctional G-quadruplex-based fluorescence assay	0.5-200	0.45	[27]
Personal glucose meter based assay	0.01-2.5	0.008	[28]
Ultrasensitive detection by DNA dendrimer- carried silver nanoparticles labeling using ICP-MS	0.05-2.0	0.02	This work

Table S4 Results of H5N1 nucleic acid fragment analysis at different concentrations (n=3).

Sample	Added (nM)	Found (nM)	Recovery (%)	RSD (%)
1	0.5	0.4	89.5	6.2
2	1.0	1.1	106	5.9
3	1.5	1.5	98.3	7.5