Supporting information

An aptasensing platform for simultaneous detection of multiple analytes based on the amplification of exonuclease-catalyzed target recycling and DNA concatamers

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Table S1

The sequences of the oligonucleotides.

TBA	5'-AAAAGTCCGTGGTAGGGCAGGTTGGGGTGACT-3'
OBA	5'-AAAGATCGGGTGTGGGTGGCGTAAAGGGAGCATCGGACA-3'
SH-cTBA	5'-AGTCACCCCAACCTGCCCTACCACGGACT-$(CH_2)_6$-SH-3'
SH-cOBA	5'-CCGATGCTCCCTTTACGCCACCCACACCCGATCGG-SH-3'
T1	5'-AAAAGTCCGTGGTAGGGCAGGTTGGGGTGACTGTACTACAGCAGCTG-3'
T2	5'-AAAGATCGGGTGTGGGTGGCGTAAAGGGAGCATCGG CATACTCGACGAAGT-3'
S1	5'-ATCTCCTAATAGCAGCAGCTGCTGTAGTAC-3'
S2	5'-NH_2-$(CH_2)_6$-CTGCTATTAGGAGATGTACTACAGCAGCTG-3'
S3	5'-GGGTAGGGCGGGTTGGGTTCATGCAACATCTAGACTTCGTCGAGTATG-3'
S4	5'-CTAGATGTTGCATGACATACTCGACGAAGT-3'

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Table S2

Cross-reactivity level of the aptasensor.

sample type	concentration (nM)	current shift at TB position (μA)[a,b]	current shift at OTA position (μA)[a,c]
TB	0.1	-5.3	-0.1
	10	-8.3	-0.3
OTA	0.1	-0.2	-3.9
	10	-0.3	-6.8
TB + OTA	0.1 + 0.1	-5.1	-3.7
	10 + 10	-8.4	-6.5

[a] The average value of three measurements.

[b] The background current was -4.2 μA at TB position.

[c] The background current was -3.5 μA at OTA position.

Table S3

Analytical application of the aptasensor.

Sample number	**Standard Values / M**		**Found Values[a] / M**		**Relative standard deviation / %**		**Recovery / %**	
	TB	**OTA**	**TB**	**OTA**	**TB**	**OTA**	**TB**	**OTA**
1	1×10^{-12}	1×10^{-12}	0.99×10^{-12}	0.96×10^{-12}	4.2	3.9	98.6	96.4
2	1×10^{-11}	1×10^{-11}	1.07×10^{-11}	0.91×10^{-11}	3.6	5.7	107.2	91.1
3	1×10^{-9}	1×10^{-9}	0.92×10^{-9}	1.02×10^{-9}	6.9	4.8	92.3	101.5
4	15×10^{-9}	15×10^{-9}	13.72×10^{-9}	14.19×10^{-9}	7.1	5.3	91.5	94.6

[a] Calculated as a mean of three measurements.

The stability and reproducibility of the aptasensor

Long-term storage stability was also examined. When the resulting aptasensors were stored in refrigerator for 7 days, the average decrease value of peak current was less than 4.6% than that of freshly prepared aptasensors. Therefore, the stability of proposed aptasensor was acceptable.

To elevate the coefficient of variation of intra-assay, aptasensors belonging to the same batch were used to detect three different concentrations of mixed targets. The variation coefficient of five times parallel test were were 4.3 %, 6.4% and 5.0% for 0.1, 1 and 10 nM TB; 3.8%, 7.2% and 5.6% for 0.1, 1 and 10 nM OTA, respectively. Thus, the aptasensor showed a desirable reproducibility.