Electronic Supplementary Material (ESI) for Analyst.

Electronic Supplementary Information

A Simple Fluorescent Aptamer Based Assay Coupled with Fluorescence Scanning Capillary Array for Aflatoxin B1

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Table S1. List of sequences of fluorescently labeled aptamer probes and determined dissociation constants (K_ds)

Name	Sequence	K_d / nM
A34-5'-FAM	5'(FAM)-TGG GCA CGT GTT GTC TCT CTG TGT CTC GTG CCC T-3'	ND
A34-T1-FAM	5'-T(FAM)GG GCA CGT GTT GTC TCT CTG TGT CTC GTG CCC T-3'	ND
A34-T9-FAM	5'-TGG GCA CGT(FAM) GTT GTC TCT CTG TGT CTC GTG CCC T-3'	ND
A34-T11-FAM	5'-TGG GCA CGT GT(FAM)T GTC TCT CTG TGT CTC GTG CCC T-3''	735 ± 49
A34-T12-FAM	5'-TGG GCA CGT GTT(FAM) GTC TCT CTG TGT CTC GTG CCC T-3'	39 ± 5
A34-T14-FAM	5'-TGG GCA CGT GTT GT(FAM)C TCT CTG TGT CTC GTG CCC T-3'	ND
A34-T16-FAM	5'-TGG GCA CGT GTT GTC T(FAM)CT CTG TGT CTC GTG CCC T-3'	501 ± 40
A34-T18-FAM	5'-TGG GCA CGT GTT GTC TCT(FAM) CTG TGT CTC GTG CCC T-3'	45 ± 9
A34-T20-FAM	5'-TGG GCA CGT GTT GTC TCT CT(FAM)G TGT CTC GTG CCC T-3'	297 ± 39
A34-T22-FAM	5'-TGG GCA CGT GTT GTC TCT CTG T(FAM)GT CTC GTG CCC T-3'	77 ± 13
A34-T24-FAM	5'-TGG GCA CGT GTT GTC TCT CTG TGT(FAM) CTC GTG CCC T-3'	8 ± 3
A34-T26-FAM	5'-TGG GCA CGT GTT GTC TCT CTG TGT CT(FAM)C GTG CCC T-3'	88 ± 8
A34-T29-FAM	5'-TGG GCA CGT GTT GTC TCT CTG TGT CTC GT(FAM)G CCC T-3'	ND
A34-T34-FAM	5'-TGG GCA CGT GTT GTC TCT CTG TGT CTC GTG CCC T(FAM)-3'	ND
A34-3'-FAM	5'-TGG GCA CGT GTT GTC TCT CTG TGT CTC GTG CCC T-3'(FAM)	ND
A34-T24-Cy5	5'-TGG GCA CGT GTT GTC TCT CTG TGT(Cy5) CTC GTG CCC T-3'	119 ± 13
A34-T24-TMR	5'-TGG GCA CGT GTT GTC TCT CTG TGT(TMR) CTC GTG CCC T-3'	48 ± 6

[a] The labeling position of FAM is shown in underlined font.

[b] *ND*: not determined because there was no significant fluorescence change upon AFB1 addition.

Table S2. A comparison of some methods for the determination of AFB1

Method	Affinity ligand	Dynamic range / nM	LOD / nM	Ref.
FRET-based assay using aptamer/quantum dots/Au nanoparticles system	Aptamer	10-400	3.4	[26]
Aptamer based fluorescent sensor using nano-graphene oxide	Aptamer	3.2-320	1.12	[38]
Direct fluorescence assay using single FAM labeled aptamer by fluorescence scanning capillary array	Aptamer	0.5-1000	0.5	this work
Label-free electrochemical impedimetric based aptasensor	Aptamer	0.4-51.2	0.4	[31]
SPR based aptasensor in a direct assay format	Aptamer	0.4-200	0.4	[28]
Chemiluminescence competitive assay using HRP-DNAzyme linked aptamer	Aptamer	0.35-32	0.35	[37]
Colorimetric assay based on assembly of aptamer/split DNAzyme	Aptamer	$0.32\text{-}3.2\times10^{4}$	0.32	[27]
Fluorescence assay based on the quenching of intrinsic fluorescence of antibodies	Antibody	0.29-320	0.29	[39]
FRET-based competitive fluorescence immunoassay	Antibody	0.1-0.6	0.02	[40]
Real-time quantitative polymerase chain (PCR) assay	Aptamer	1.5×10^{-4}-15	8×10^{-5}	[29]
Surface enhanced Raman scattering (SERS) aptasensor based on exonuclease-assisted recycling amplification	Aptamer	3.2×10^{-6} - 3.2	1.28×10^{-6}	[30]

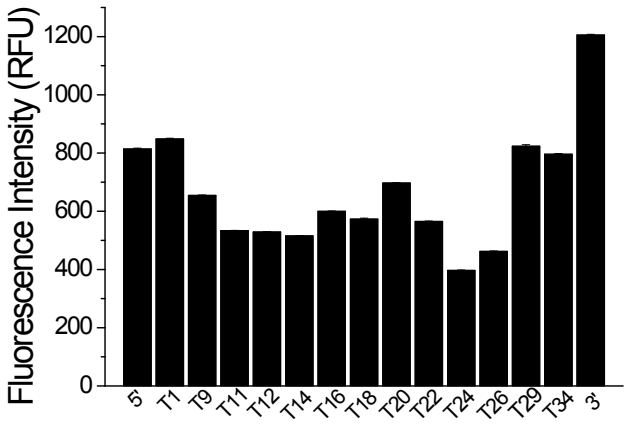

Fig. S1 Fluorescence intensity of FAM-labeled aptamers in the absence of AFB1 with respect to labeling positions of FAM on the aptamer.

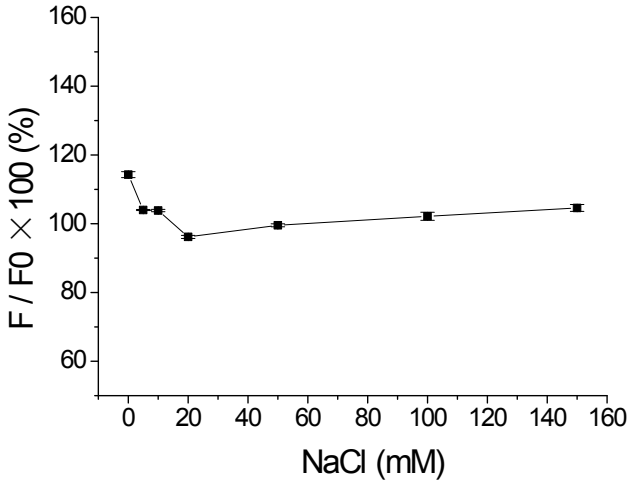

Fig. S2 Effect of NaCl in the binding buffer without containing $MgCl_2$ on the fluorescence intensity change of A34-T24-FAM upon addition of 50 nM AFB1. F was the fluorescence intensity of the AFB1 sample, and F0 was fluorescence intensity of the blank sample without containing AFB1.

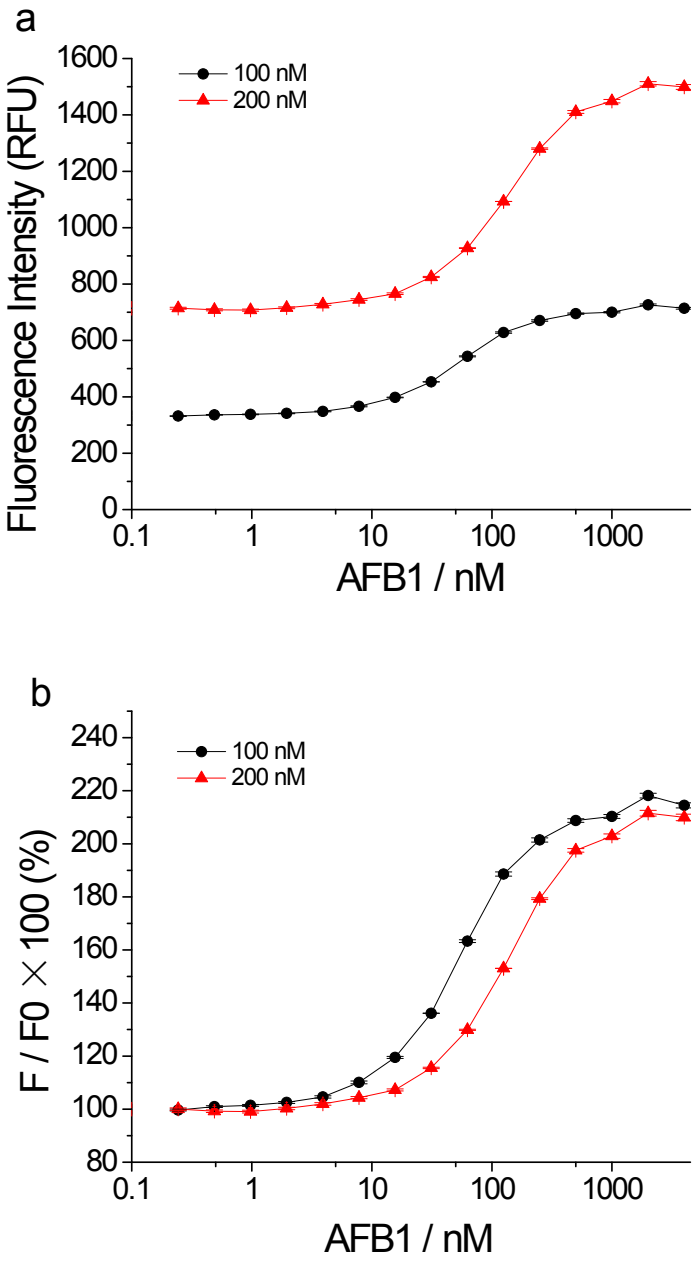

Fig. S3 Comparison of detection of AFB1 using different concentrations of A34-T24-FAM (100 nM or 200 nM). (a) Fluorescence intensity versus varying concentrations of AFB1. (b) Relationship between fluorescence intensity change and concentrations of AFB1. F was the fluorescence intensity of the AFB1 sample, and F0 was fluorescence intensity of the blank sample without containing AFB1.