Electronic Supplementary Material

Complementary DNA significantly enhanced signal response and sensitivity of a molecular beacon probe to aflatoxin B1

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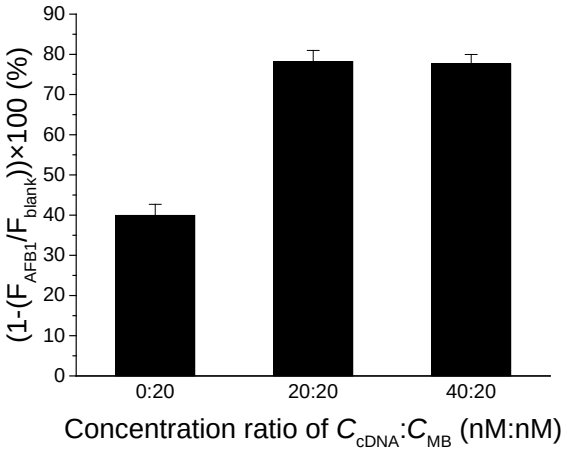

Fig. S1. Selection of concentration ratio between molecular beacon and complementary DNA strand. Assay buffer (pH 7.5) containing 20 mM Tris-HCl, 20 mM $MgCl_2$, 200 mM NaCl and 0.1% (v/v) tween20 was used. AFB1 concentration was 500 nM. Excitation/emission was 485 nm/518 nm. Incubation at 4 ^{o}C was applied.

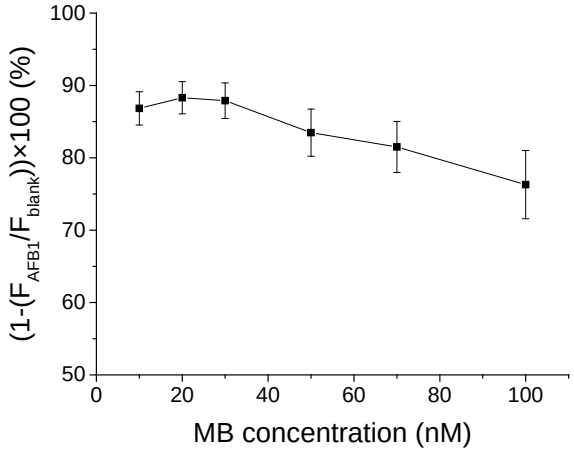

Fig. S2. Selection of MB concentration. Assay buffer (pH 7.5) containing 20 mM Tris-HCl, 20 mM $MgCl_2$, 200 mM NaCl and 0.1% (v/v) tween20 was used. MB probe concentration was 20 nM. cDNA concentration was 20 nM, AFB1 concentration was 500 nM. Excitation/emission was 485 nm/518 nm. Incubation at 4 ^{o}C was applied.

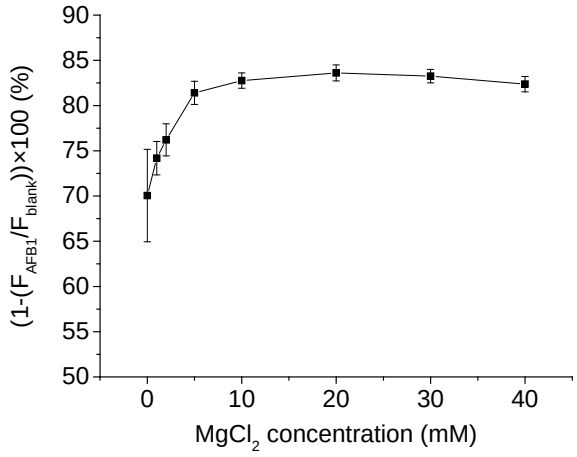

Fig. S3. Optimization of $MgCl_2$ concentration in assay buffer. Assay buffer (pH 7.5) containing 20 mM Tris-HCl, 200 mM NaCl, 0.1% (v/v) tween20 and different $MgCl_2$ concentrations was used. MB probe concentration was 20 nM, cDNA concentration was 20 nM, AFB1 concentration was 500 nM. Excitation/emission was 485 nm/518 nm. Incubation at 4 ^{o}C was applied.

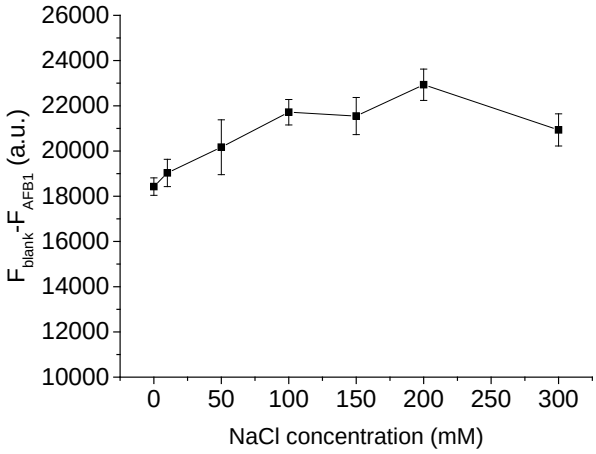

Fig. S4. Effects of NaCl concentration in assay buffer on detection performance. Assay buffer (pH 7.5) containing 20 mM Tris-HCl, 20 mM $MgCl_2$, 0.1% (v/v) tween20 and different NaCl concentrations was used. MB probe concentration was 20 nM. cDNA concentration was 20 nM, AFB1 concentration was 500 nM. Excitation/emission was 485 nm/518 nm. Incubation at 4 ^{o}C was applied.

Table S1 Comparison of some aptamer-based sensors for AFB1

Strategies	Detection range	LOD	References
Assay using fluorescein-labeled aptamer and quencher labeled complementary DNA (cDNA)	16-320 nM	5.1 nM	[1]
Fluorescent aptasensor using AIEgens and graphene oxide	0.8-10 nM	0.8 nM	[2]
FRET-based aptasensor	10-400 nM	3.4 nM	[3]
Aptamer with dual-terminal proximity structures	3.2-3200 nM	2.9 nM	[4]
Assay using a quencher system composed of quantum dots and graphene oxide	3.2 nM-320 μM	1.0 nM	[5]
Aptamer assay using aggregation-induced emission dyes	1.0 nM-16 μM	1.0 nM	[6]
An aptamer-based lateral flow strip	--	0.3 nM	[7]
A simple molecular beacon probe enhanced with cDNA	1 nM-3 μM	1 nM	This work

References

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