

Electronic Supplementary Information

Dual signal amplification for microRNA-21 detection based on duplex-specific nuclease and invertase

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Supplementary Tables

Table S1. Oligonucleotides designed in the present study

Name	Sequence(5' to 3')
miRNA-21	UAGCUUAUCAGACUGAUGUUGA
Target DNA	TAGCTTATCAGACTGATGTTGA
DNA strand 1	Biotin-AAAAATCAACATCAGTCTGATAAGCTA-(A) ₅ -SH
DNA strand 2	Biotin-AAAAATCAACATCAGTCTGATAAGCTA-(A) ₁₀ -SH
DNA strand 3	Biotin-AAAAATCAACATCAGTCTGATAAGCTA-(A) ₁₅ -SH
DNA strand 4	Biotin-AAAAATCAACATCAGTCTGATAAGCTA-(A) ₂₀ -SH
DNA strand 5	Biotin-AAAAATCAACATCAGTCTGATAAGCTA-(A) ₂₅ -SH
Mismatch-1	UAGCUUAUCAC <u>A</u> CUGAUGUUGA
Mismatch-2	UAGCAA <u>A</u> UCAGAC <u>A</u> GGAUGUUGA
Mismatch-3	UAGCUUA <u>A</u> CAGACUGAUGAAGA
hsa-miR-200c	CGTCTTACCCAGCAGTGTTTG
hsa-miR-4640	UGGGCCAGGGAGCAGCUGGUGGG
hsa-miR-423	UGAGGGGCAGAGAGCGAGACUUU
NC	UUGUACUACACAAAAGUACUG

Table S2. Analytical performance of reported methods and proposed method for miRNA detection

Limit of detection	Linear range	Strategy	References
1.1 nM	None	Electrochemiluminescence	Shamsi <i>et al.</i> ¹
500 pM	0.5 nM–200 nM	Fluorometric assay	Song <i>et al.</i> ²
230 pM	0 - 6.25 nM	Fluorometric assay	Lee <i>et al.</i> ³
80 pM	49.6 pM–50 nM	Chemiluminescence	Wang <i>et al.</i> ⁴
8 pM	25 pM–1 nM	Chemiluminescence	Li <i>et al.</i> ⁵
2.79 pM	10 pM–100 nM	H ₂ O ₂ decomposition	Lei <i>et al.</i> ⁶
1.8 pM	20 pM–200 pM	DSN-assisted signal amplification	This work

Supplementary Figures

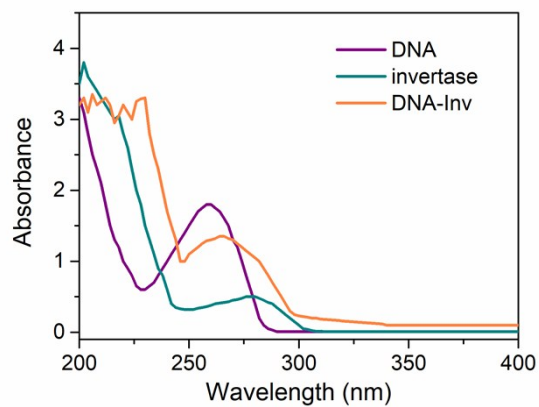


Figure S1. Absorption spectra of the thiol-DNA, invertase, and DNA-Inv conjugate.

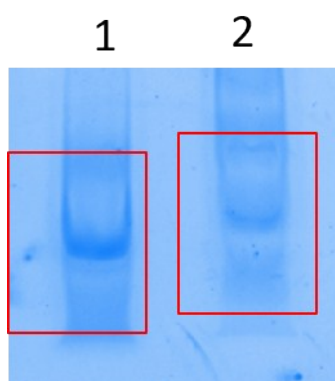


Figure S2. 6% SDS PAGE images of invertase and DNA-Inv conjugate. Lane 1: invertase; Lane 2: DNA-Inv conjugate.

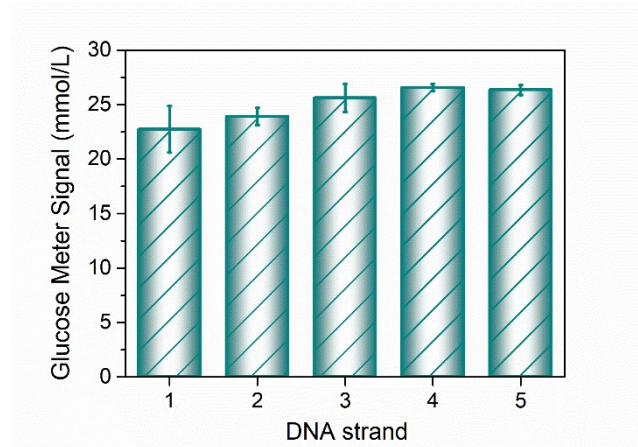


Figure S3. The effect of MBs-DNA-Inv probes immobilized with different DNA strand 1-5 with different lengths of adenine domain (5, 10, 15, 20, 25) for the target miRNA-21 detection assay. Data are means \pm SD (n=3).

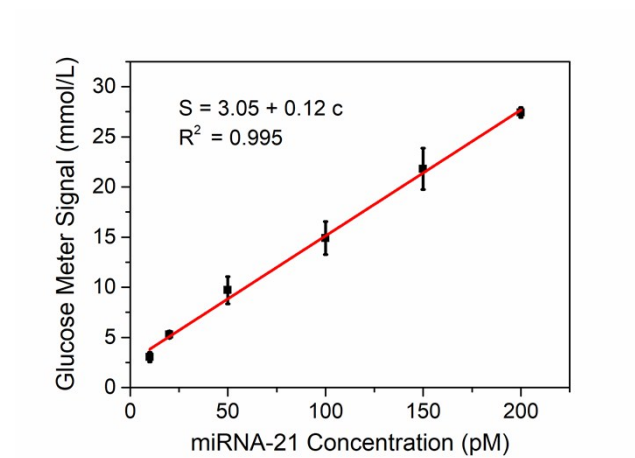


Figure S4. Linear relationship between the concentration of added miRNA-21 in urine from healthy mice and PGM signal. Data are means \pm SD (n=3).

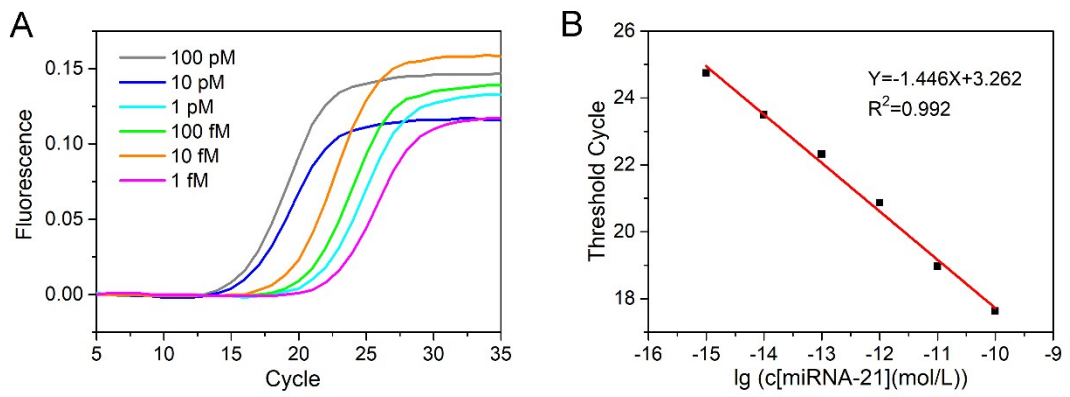


Figure S5. (A) Real-time qRT-PCR curves of different concentrations of target miRNA-21, which has been converted to cDNA before amplification. (B) The linear relationship between the miRNA-21 concentration and the threshold cycle.

References

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