Electronic Supplementary Material (ESI) for Analytical Methods.

A Simple Colorimetric Sensing Platform Based on Site-Specific Endonuclease IV-Aided Signal Amplification for the Detection of DNA Related to the Human Immunodeficiency Virus

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SUPPORTING INFORMATION FILE

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Table S1 The sequences of oligonucleotides employed in the sensing platform

Name	Sequence (from 5'- 3')
Target	GCTAGAGATTTTCCACACTGACT
LFSP 1	AACCC AGTCAGTGTGGAAAATCTCTAGC
	GGGTTGGGCGGGATGGG
Strand 1	CTAGCGGGTTGGGCGGGATGGG
Strand 2	AACCCAGTCAGTGTGGAAAATC
LFSP 2	CAACCC AGTCAGTGTGGAAAATCTCTAGC
	GGGTTGGGCGGGATGGG
Strand 3	CAACCCAGTCAGTGTGGAAAATC
LFSP 3	CCAACCC AGTCAGTGTGGAAAATCTCTAGC
	GGGTTGGGCGGGATGGG
Strand 4	CCAACCCAGTCAGTGTGGAAAATC
LFSP 4	CCCAACCC AGTCAGTGTGGAAAATCTCTAGC
	GGGTTGGGCGGGATGGG
Strand 5	CCCAACCCAGTCAGTGTGGAAAATC
LFSP 5	GCCCAACCC AGTCAGTGTGGAAAATCTCTA
	GCGGGTTGGGCGGGATGGG
Strand 6	GCCCAACCCAGTCAGTGTGGAAAATC
SP 1	CCAACCC AGTCAATGXGGAAAATCTCTAGC
	GGGTTGGGCGGGATGGG
SP 2	CCAACCC AGTCAGTGTGGAAAXTCTCTAGC
	GGGTTGGGCGGGATGGG
SP 3	CCAACCC AGTCAGTGTGGAAAATCACTXGC
	GGGTTGGGCGGGATGGG
MT 1	TTTTTTTTTTTTTTTTTTTTT
MT 2	GATAGAAATTTTCCACACTGACT
MT 3	GCTAGATATTTTCCACACTGACT

X represents the abasic sites, and the underlined bases denote mismatched bases.

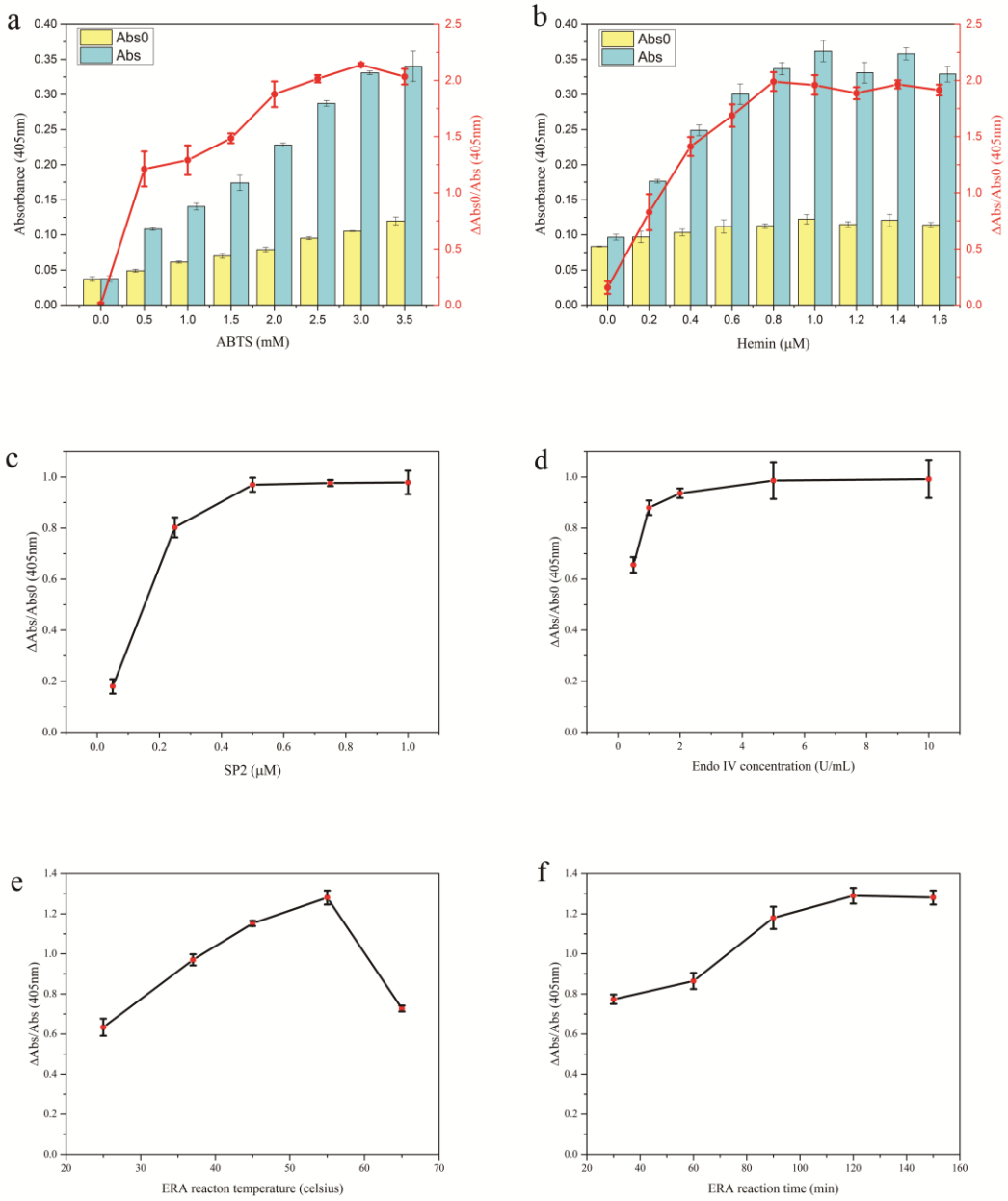

Figure S1 The effect of the concentration of (a) ABTS and (b) hemin on the signal. Reaction conditions: 100 nM of five label-free signal probes and corresponding five pairs of fragments, 5 mM H_2O_2; The effect of the concentration of (c) SP 2 and (d) Endo IV on the signal. Reaction conditions: 50 nM targeted DNA, 3 mM ABTS, 0.8 μM hemin, 5 mM H_2O_2, Endo IV-aided signal amplification reaction temperature and time are 37 ℃ and 2.5 hours, respectively; The effect of Endo IV-aided signal amplification reaction (e) temperature and (f) time on the signal. Reaction conditions:

3 mM ABTS, 0.8 μM hemin, 5 mM H_2O_2, 0.5 μM SP 2, 50 nM targeted DNA, 5 U mL^{-1} Endo IV. Notice: in Fig. S1c, d, e, f, Abs and Abs0 were the values of absorbance intensity at 405 nm in the presence and absence of the targeted DNA, respectively. However, in Fig. S1a, b, Abs and Abs0 show the values of absorbance intensity at 405 nm, which was generated by the synthesized primers (LFSP 3, strand 1 and strand 4) to simulate backgrounds and signals

Table S2 Comparison of the performance of the proposed method with the reported literatures

Sensing element	Transducer used	Detection range	LOD	Ref.
DNAzyme/thioflavin T	Fluorescence	2.4-200 nM	2.4 nM	1
DNAzyme/AgNCs	Fluorescence	0.053-2 μM	0.053 μM	2
DNAzyme	Colorimetric	9.48-100 nM	9.48 nM	3
DNAzyme	Colorimetric	4-50 nM	4 nM	4
DNAzyme	Colorimetric	1.2-120 nM	1.2 nM	This work

Table S3 Detection of the targeted DNA in human serum with the proposed method

Target DNA added (nmol/L)	Detected by the Sensing platform (nmol/L)	Spiked recovery (%)	RSD (%)
40	46.3	115.8	2.20
80	78.35	97.9	2.02
120	109.79	91.5	3.53

The data was calculated based on the standard curve and all the data were of three independent repeats.

References

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