Supplementary Material

Base Excision Repair Initiated Rolling Circle Amplification-based Fluorescent Assay for Screening Uracil-DNA Glycosylase Activity Using Endo IV-assisted Cleavage of AP Probes

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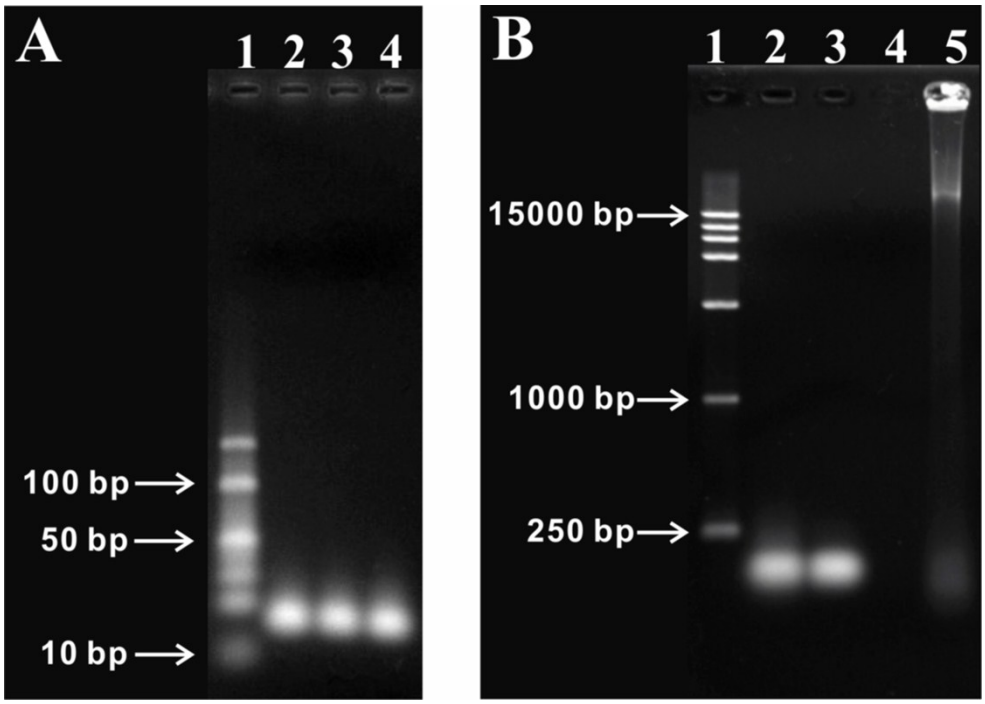

Fig. S1 (A) Gel electrophoresis image of UDG-catalyzed base excision repair reaction. Lane 1, DNA marker; Lane 2, HP; Lane 3, HP incubated with Endo IV; Lane 4, HP incubated with Endo IV and UDG. (B) Gel electrophoresis image of RCA reaction. Lane 1, DNA marker; Lane 2, padlock probe and ligation probe incubated with T4 DNA ligase; Lane 3, padlock probe and ligation probe incubated with T4 DNA ligase, Exo I, and Exo III; Lane 4, padlock probe and ligation probe incubated with Exo I, and Exo III; Lane 5, RCA products.

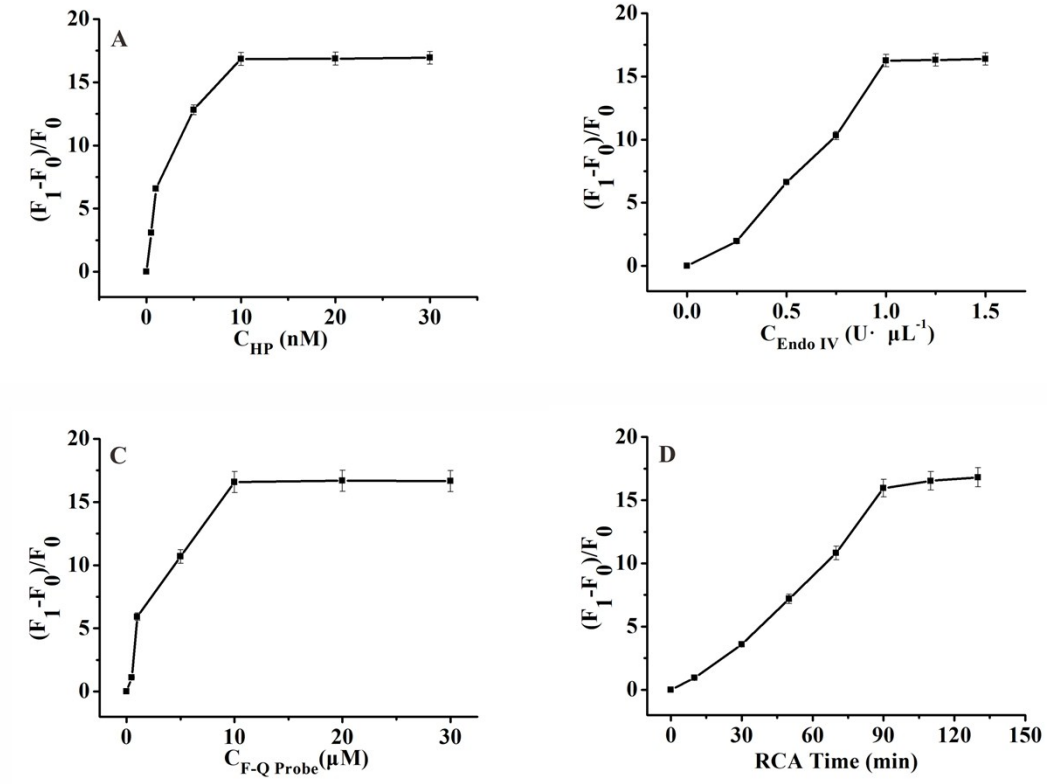

Fig. S2 (A) Effect of the concentration of the HP on the Fluorescence emission peak of the biosensor. (B) Effect of the concentration of Endo IV on the Fluorescence emission peak of the biosensor. (C) Effect of the concentration of the F-Q Probe on the Fluorescence emission peak of the biosensor. (D) Effect of the RCA reaction time on the Fluorescence emission peak of the biosensor. F_1 and F_0 represent the fluorescence emission peak intensity at 520 nm in the presence and absence of 1 U·mL^{-1} UDG respectively. Error bars are standard deviations across three repetitive experiments.

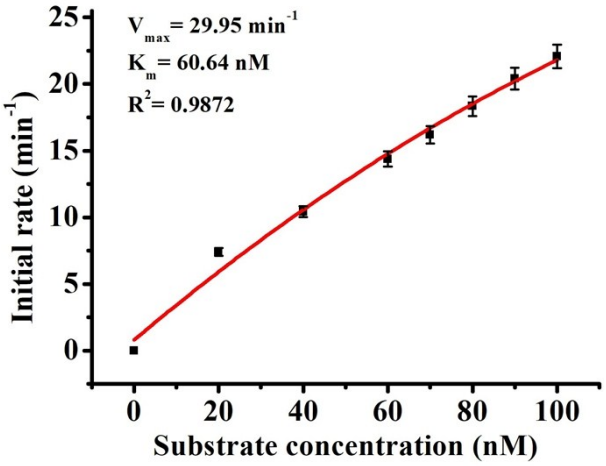

Fig. S3 Variance of initial velocity with the concentration of DNA substrate. Error bars are standard deviations across three repetitive experiments.

Table S1 Comparison of different methods for UDG activity detection.

Detection methods	Label or signal	Detection range	Detection	Reference

	reagent	(U/mL)	limit (U/mL)	
Colorimetric method	$ABTS^{2-}$	1.0×10^{-4}- 1.0	1.0×10^{-4}	[1]
Colorimetric method	$ABTS^{2-}$	6.0×10^{-2}- 8.0	2.0×10^{-2}	[2]
Electrochemical method	graphene/GCE	5.0×10^{-2}- 1.1	1.0×10^{-2}	[3]
resonance Rayleigh scattering	Free	2.0×10^{-5}- 4.0×10^{-1}	1.0×10^{-5}	[4]
Fluorescent method	2-AP	2.0×10^{-2}- 5.0	2.0×10^{-2}	[5]
Fluorescent method	SYBR Green I	1.0×10^{-3}- 1.0	6.8×10^{-4}	[6]
Fluorescent method	ThT	1.0×10^{-2}- 5.0	1.0×10^{-2}	[7]
Fluorescent method	P-dC	5.0×10^{-3}- 50	2.5×10^{-3}	[8]
Fluorescent method	ThT	1.0×10^{-2}- 20	7.8×10^{-3}	[9]
Fluorescent method	FAM	1.0×10^{-5}- 5.0	9.3×10^{-5}	This work

References

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