Electronic Supplementary Information for

Structure-adaptive dual-function polyT sequences enable homogeneous label-free colorimetric sensing platform

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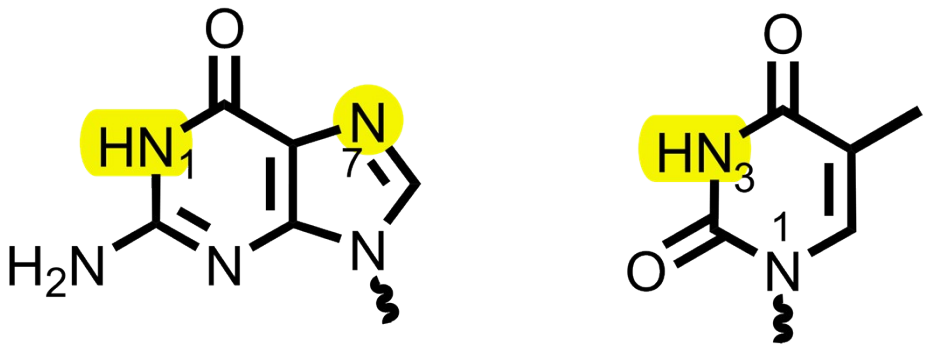

Fig. S1 The chemical structures of guanine and thymine.

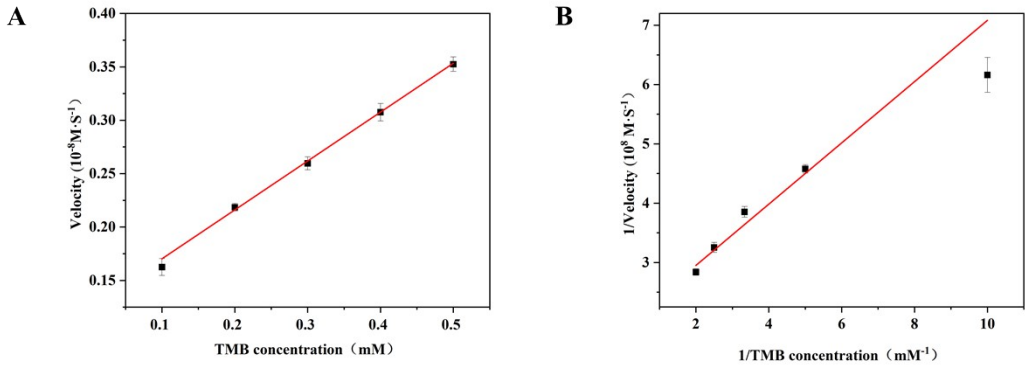

Fig. S2 (A) The Michaelis-Menten curve of T_{10} towards TMB. (B) The corresponding Lineweaver-Burk plots.

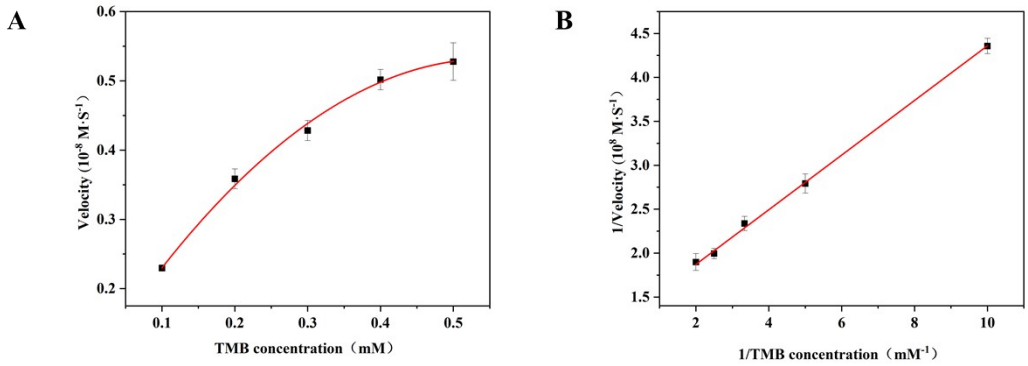

Fig. S3 (A) The Michaelis-Menten curve of T_{16} towards TMB. (B) The corresponding Lineweaver-Burk plots.

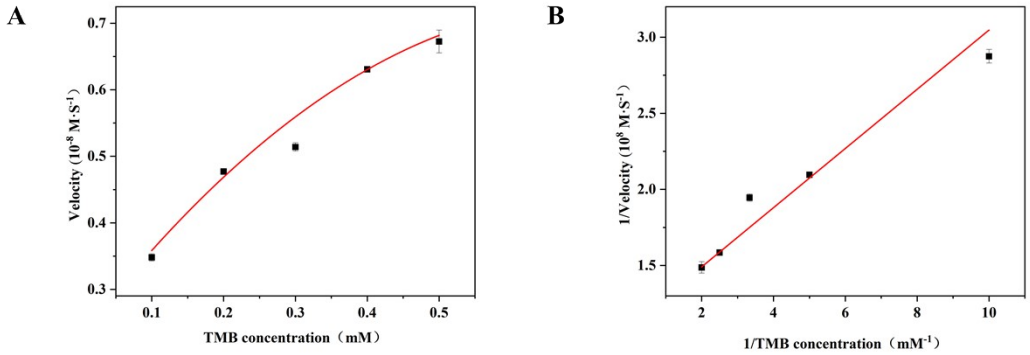

Fig. S4 (A) The Michaelis-Menten curve of T_{36} towards TMB. (B) The corresponding Lineweaver-Burk plots.

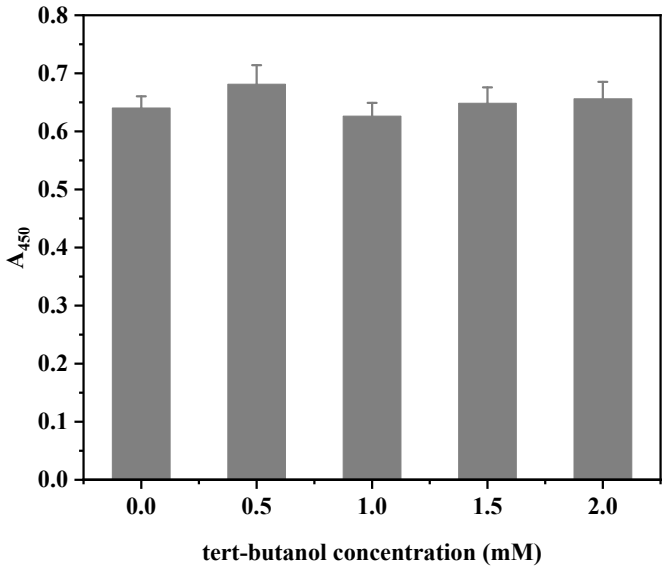

Fig. S5 Effect of different tert-butanol concentrations on DNA catalysis.

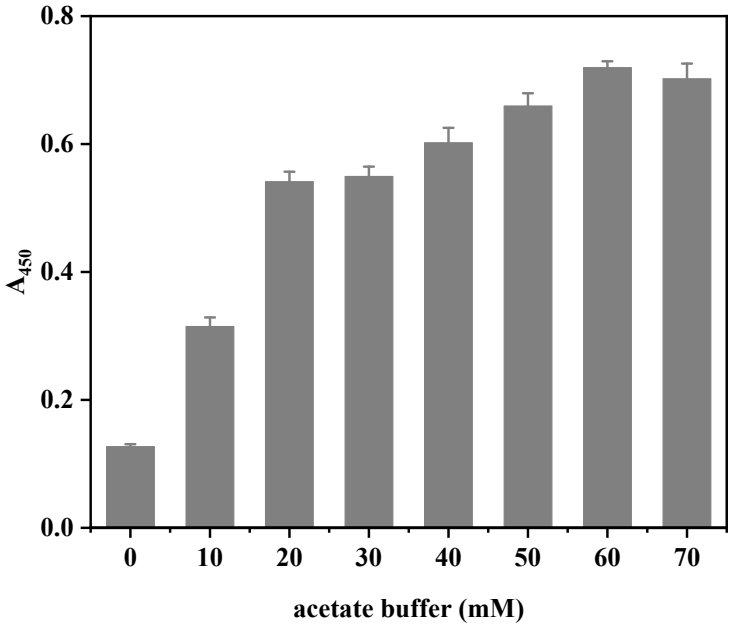

Fig. S6 Effect of acetate buffer concentration on DNA catalysis.

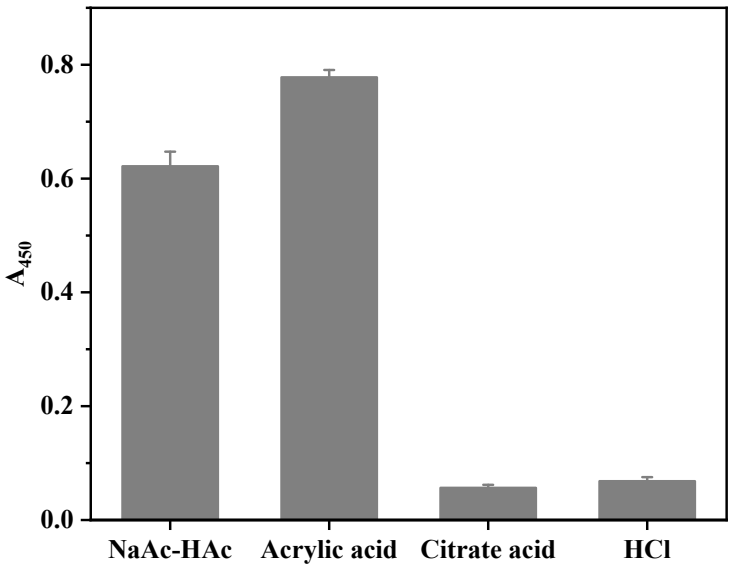

Fig. S7 Effect of different buffers on DNA catalysis.

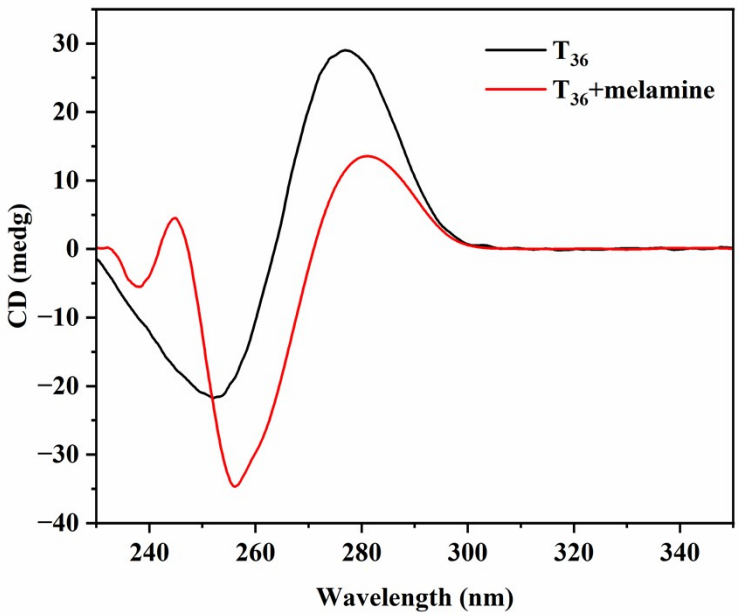

Fig. S8 CD spectra of T_{36} probe with and without melamine.

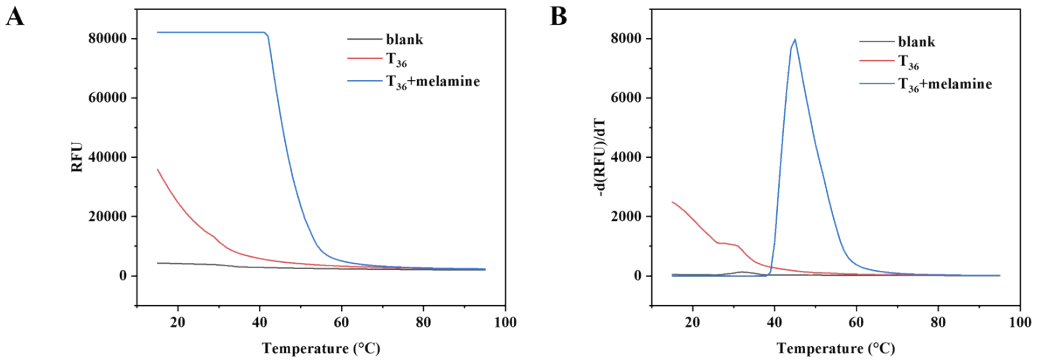

Fig. S9 (A) Fluorescence melting curves of T_{36} with and without melamine. (B) The corresponding derivative plots T_m determination.

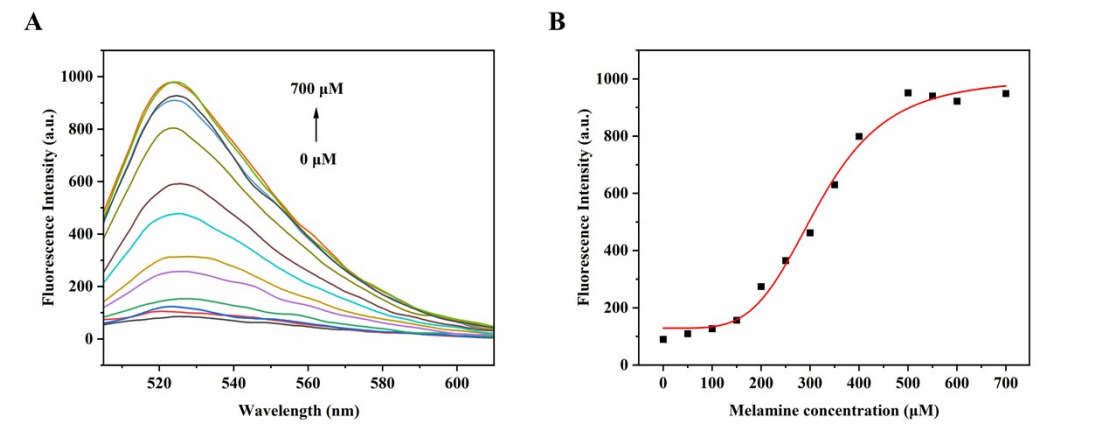

Fig. S10 (A) Fluorescence titration spectra of the SYBR Green I/poly-T probe with different concentrations of melamine. (B) Plot of fluorescence intensity as a function of melamine concentration.

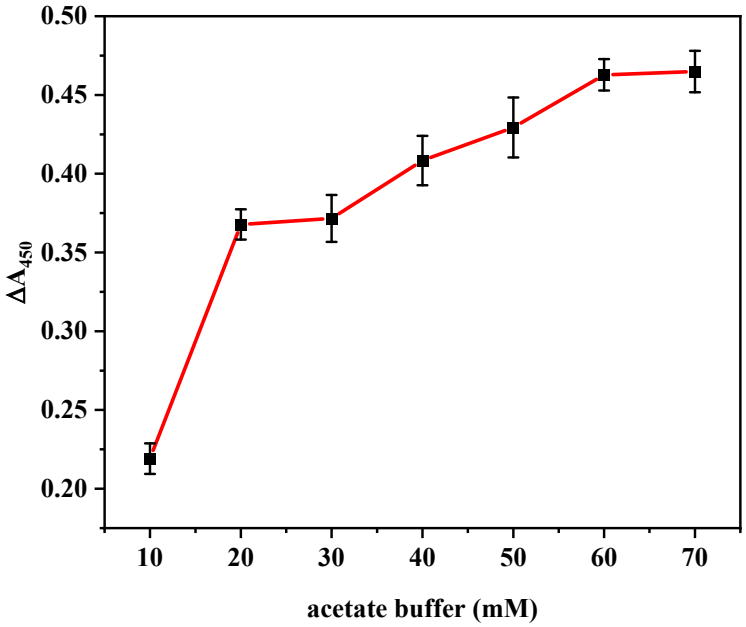

Fig. S11 Effect of acetate buffer concentration on detection of melamine ($\Delta A_{450}=A_0-A_1$, A_0 and A_1 correspond to the absorbance values at 450 nm in the absence and presence of melamine, respectively).

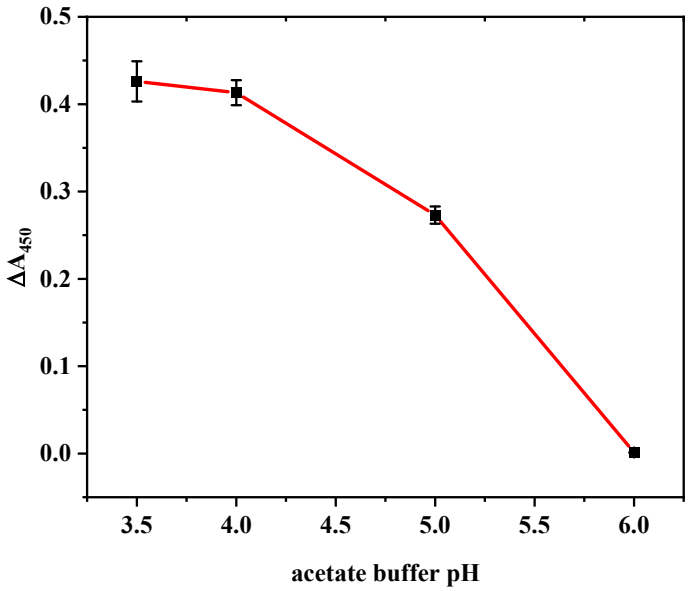

Fig. S12 Effect of acetic acid buffer pH on detection of melamine ($\Delta A_{450}=A_0-A_1$, A_0 and A_1 correspond to the absorbance values at 450 nm in the absence and presence of melamine, respectively).

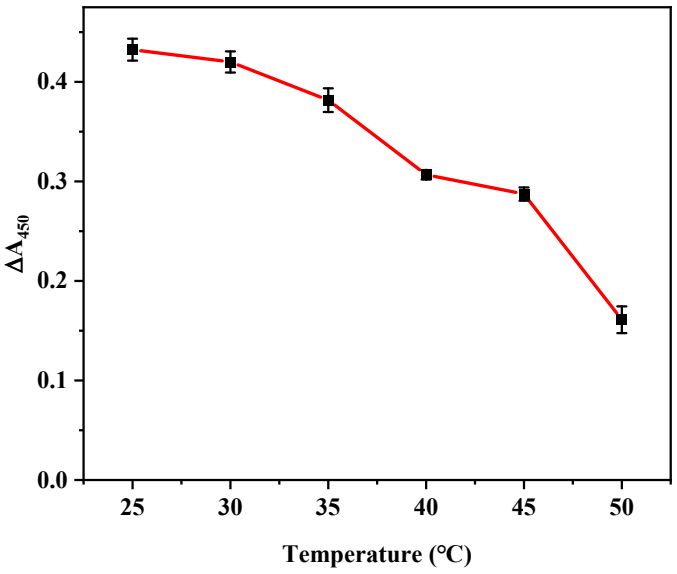

Fig. S13 Effect of temperature on detection of melamine ($\Delta A_{450}=A_0-A_1$, A_0 and A_1 correspond to the absorbance values at 450 nm in the absence and presence of melamine, respectively).

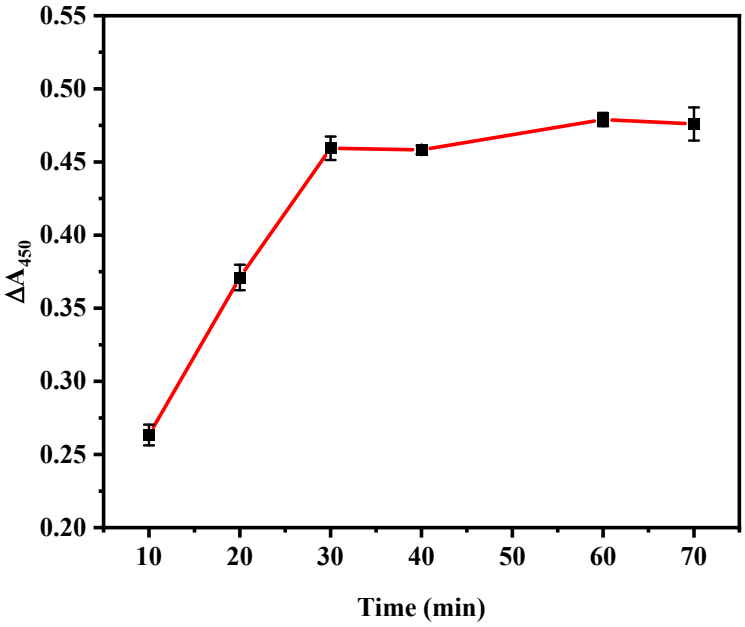

Fig. S14 Effect of reaction time on detection of melamine ($\Delta A_{450}=A_0-A_1$, A_0 and A_1 correspond to the absorbance values at 450 nm in the absence and presence of melamine, respectively).

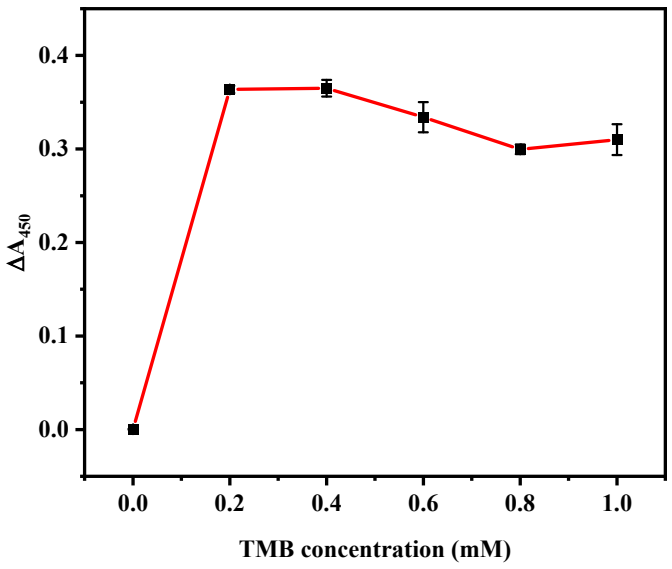

Fig. S15 Effect of TMB concentration on detection of melamine ($\Delta A_{450}=A_0-A_1$, A_0 and A_1 correspond to the absorbance values at 450 nm in the absence and presence of melamine, respectively).

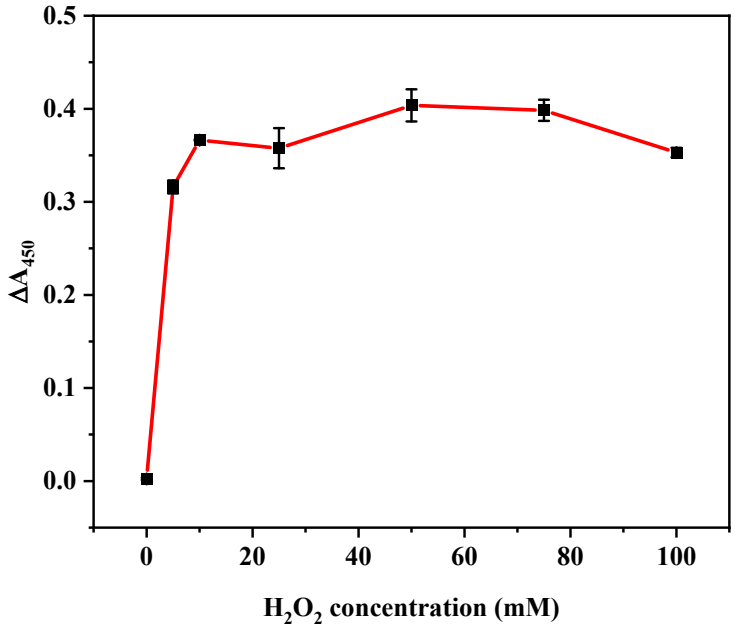

Fig. S16 Effect of H_2O_2 concentration on detection of melamine ($\Delta A_{450}=A_0-A_1$, A_0 and A_1 correspond to the absorbance values at 450 nm in the absence and presence of melamine, respectively).

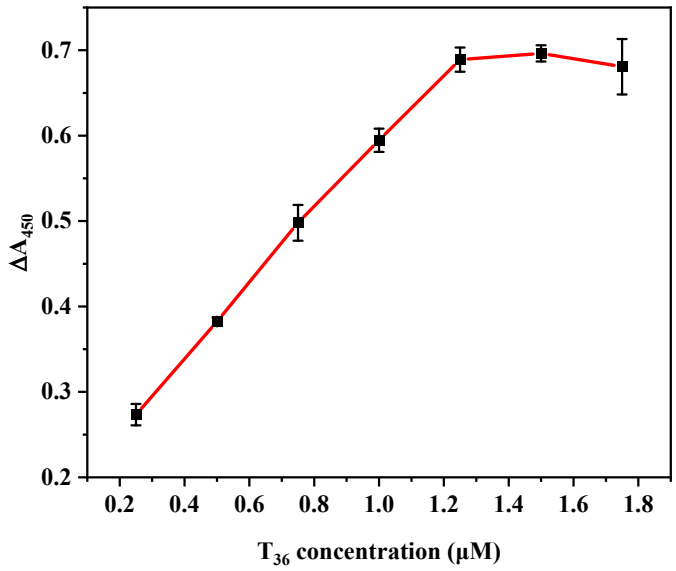

Fig. S17 Effect of T_{36} concentration on detection of melamine ($\Delta A_{450}=A_0-A_1$, A_0 and A_1 correspond to the absorbance values at 450 nm in the absence and presence of melamine, respectively).

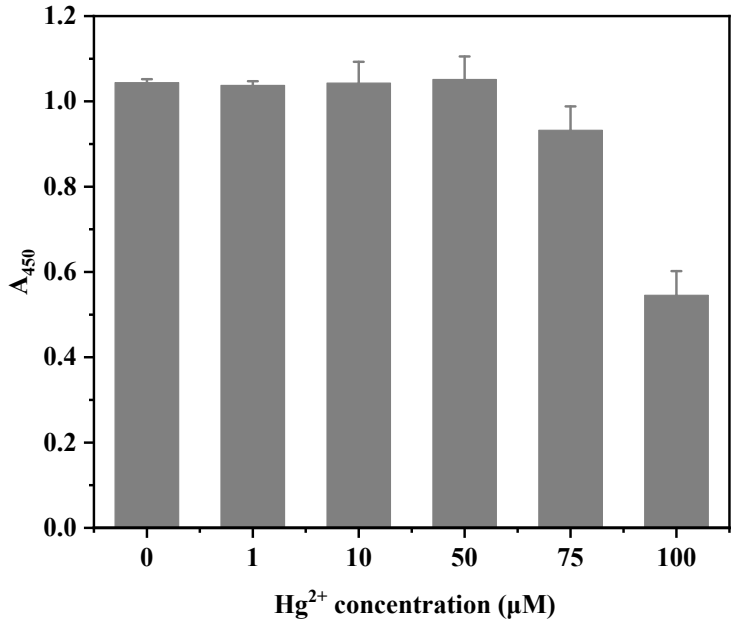

Fig. S18 Effect of different Hg^{2+} concentrations on DNA catalysis.

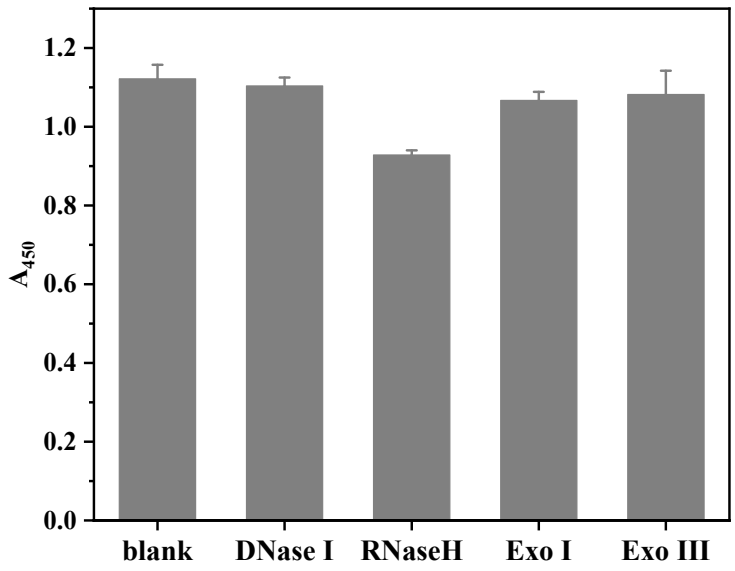

Fig. S19 Effect of nucleases on DNA catalysis.

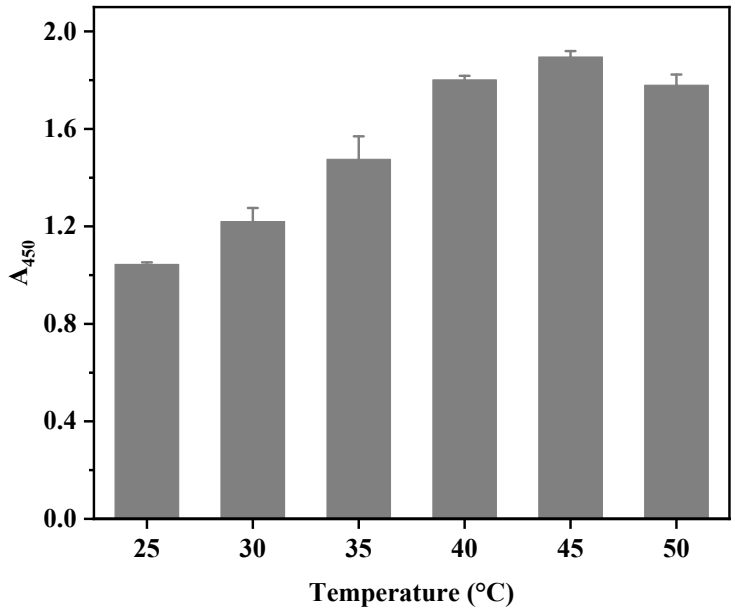

Fig. S20 Effect of temperature on DNA catalysis.

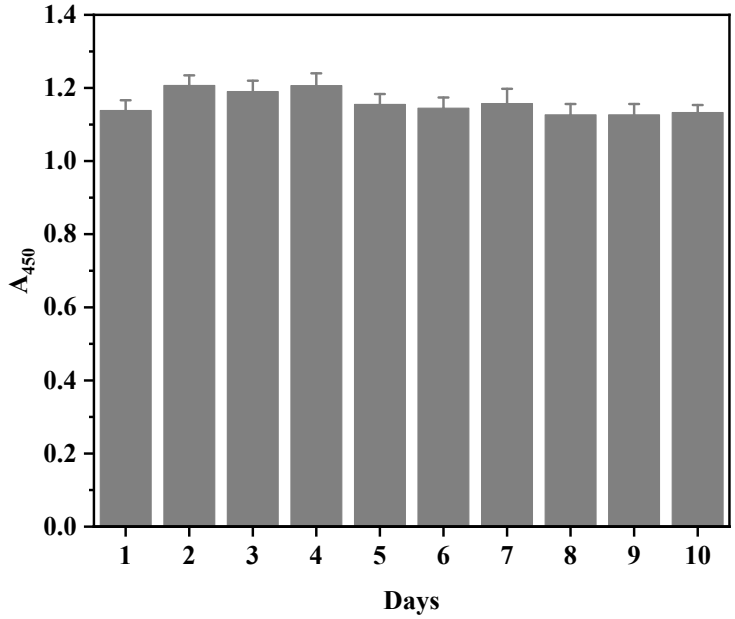

Fig. S21 The change in catalytic activity of T_{36} over a 10-day period.

Table S1 The oligonucleotides used in this work

Oligonucleotides	Oligonucleotide Sequences
T_{10}	5′-TTTTTTTTTT-3′
T_{16}	5’-TTTTTTTTTTTTTTTT-3’
T_{24}	5’-TTTTTTTTTTTTTTTTTTTTTTTT-3’
T_{36}	5’-TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT-3’
$T_{32}C_4$	5’-TTTTTTTTTTTTTTTTCCCCTTTTTTTTTTTTTTTT-3’
$T_{34}C_2$	5’-TTTTTTTTTTTTTTTTCCTTTTTTTTTTTTTTTT-3’
$T_{31}G_2C_2A$	5’-TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTGGCCA-3’
$T_{28}C_6G_2$	5’-TTTTTTTTTTTTTTTTTTTTTTTTTTTTCCCCCCGG-3’
$C_{11}G_6A_3$	5’-CCCCCCCCCCCGGGGGGAAA-3’

Table S2 Kinetic parameters of poly-T sequences towards TMB

catalyst	K_m (mM)	V_{max} (10^{-9} M·S^{-1})
T_{10}	0.270	5.22
T_{16}	0.249	8.00
T_{36}	0.176	9.08