Supporting information

A Facile Deoxyuridine/Biotin Modified Molecular Beacon for Simultaneous Detection of Protein and Nucleic Acid via Label-free and Background-eliminated Fluorescence Assay

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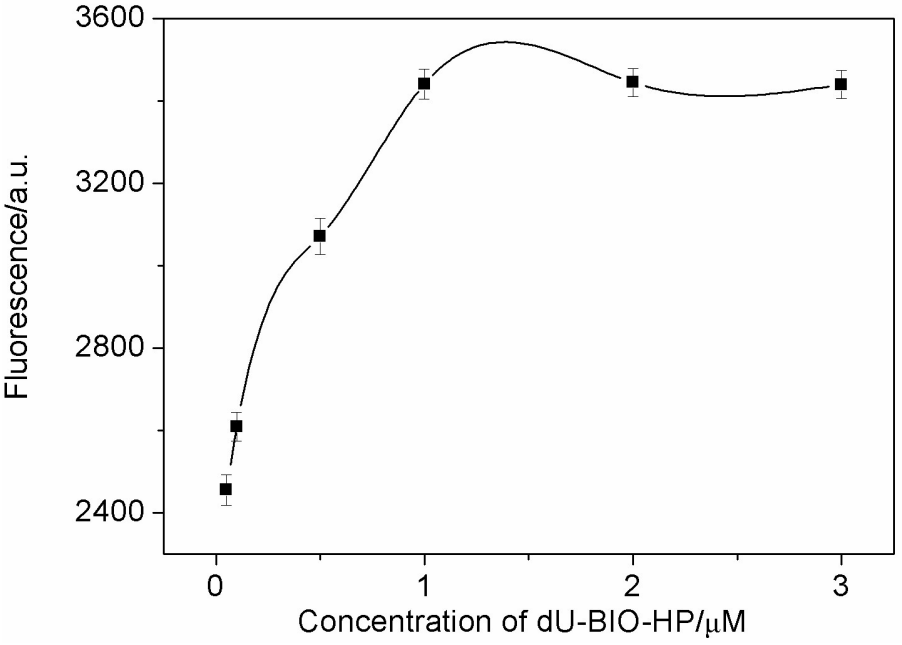

Fig. S1. Effect of the concentration of hybridized hairpin probe on the relative fluorescence intensities of the sensing system. The error bars represent the standard deviation of three repetitive measurements.

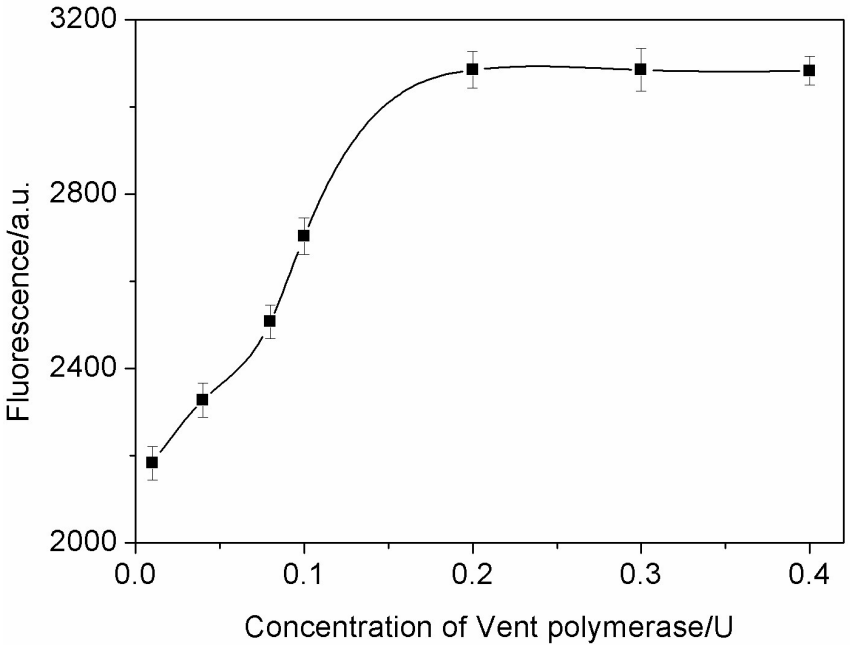

Fig. S2. Effect of the dosage of Vent DNA polymerase on the relative fluorescence intensities of the sensing system. The error bars represent the standard deviation of three repetitive measurements.

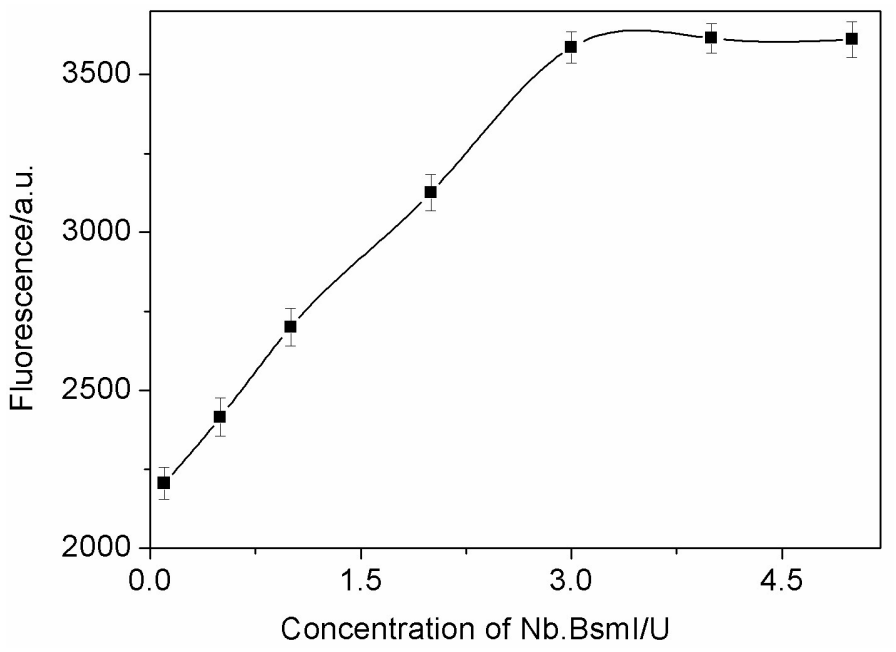

Fig. S3. Effect of the dosage of Nb. BsmI on the relative fluorescence intensities of the sensing system. The error bars represent the standard deviation of three repetitive measurements.

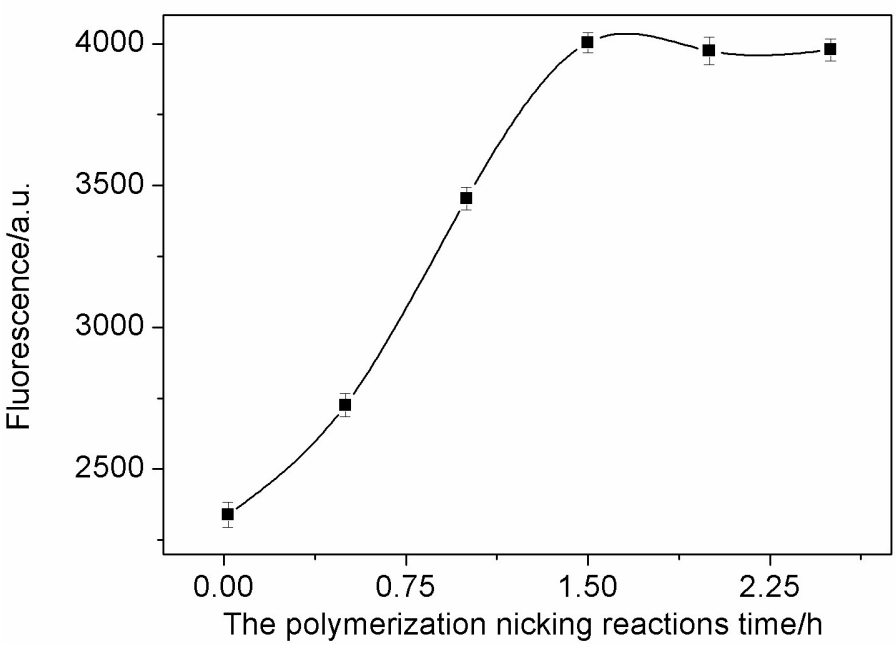

Fig. S4. Effect of polymerization nicking reactions time on the relative fluorescence intensities of the sensing system. The error bars represent the standard deviation of three repetitive measurements.

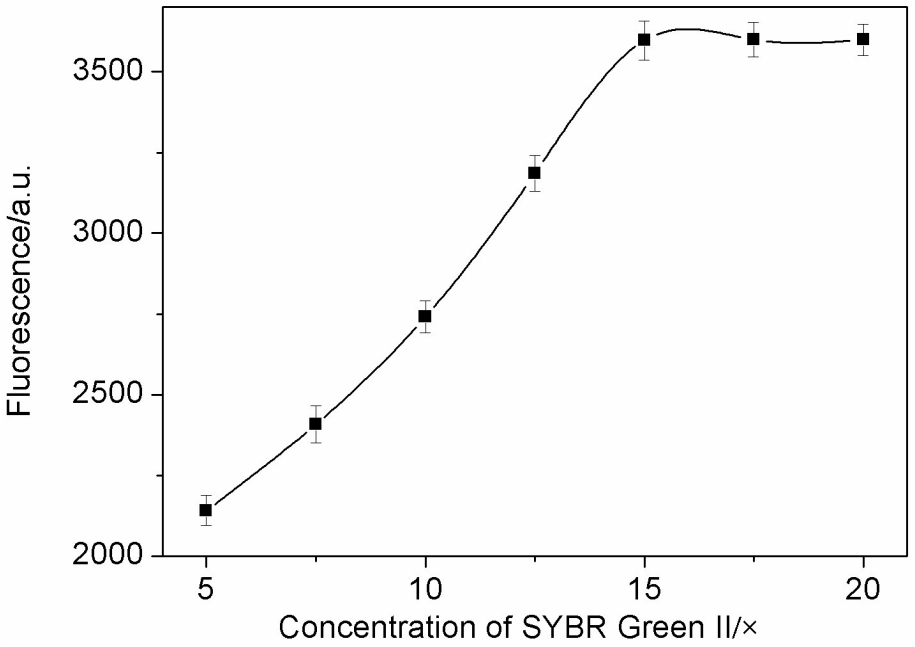

Fig. S5. Effect of the concentration of SYBR Green II on the biosensor response. The error bars represent the standard deviation of three repetitive measurements.

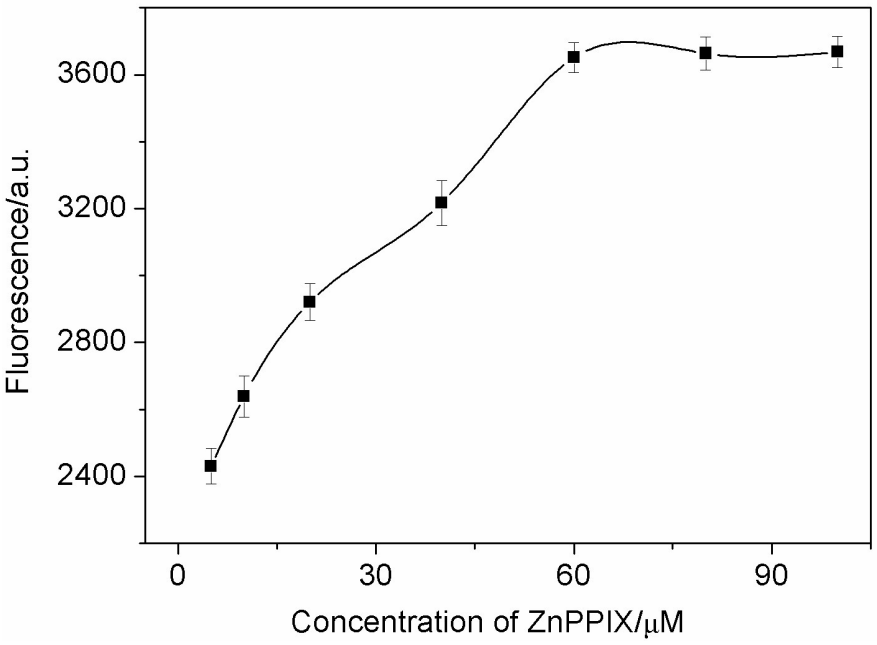

Fig. S6. Effect of the concentration of ZnPPIX on the biosensor response. The error bars represent the standard deviation of three repetitive measurements.

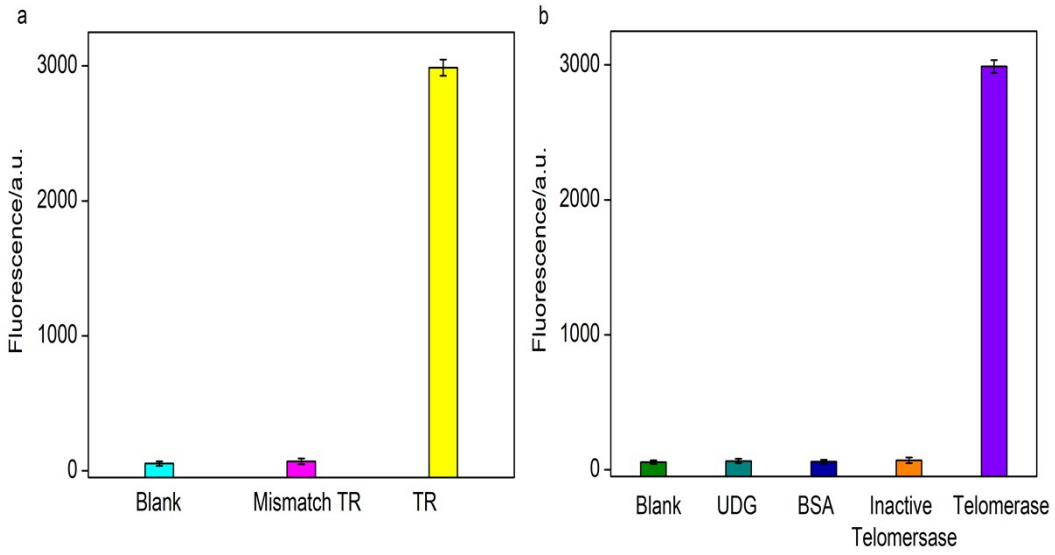

Fig. S7. The selectivity of the proposed amplification strategy for the telomerase and TR assay, the concentration of telomerase, heat-inactivated telomerase and uracil DNA glycosylase (UDG) is 9×10^{-7} IU/mL, 9×10^{-5} IU/mL and 10^{-2} U/mL, the concentration of bovine serum albumin (BSA), TR and mismatch TR (ACG GGC UGG CUA CGG UAU AAG) is 5 μM, 1 μM and 10 μM. The error bars represent the standard deviation of three repetitive measurements.

Table S1. Comparison of different methods for telomerase activity detection

Signal readout	amplification	Detection Limit	Detection Range	Ref
Colorimetry	+	25 HeLa cells	50-1000 HeLa cells	1
Colorimetry	-	29 HL-60 cells/mL	0-200 HL-60 cells/mL	2
FCS	+	1 HeLa cell	10-1500 HeLa cells	3
SERS	++	1 cell	5-100 cells	4
Chemiluminescence	+	15 HeLa cells	20-500 HeLa cells	5
Photoelectrochemical	-	53 HeLa cells	100-2000 HeLa cells	6
Electrochemistry	+	2 HeLa cells	10-10 000 HeLa cells	7
Electrochemistry	-	1 HeLa cell	2-1000 HeLa cells	8
Electrochemistry	-	3 HeLa cell	10-10000 HeLa cells	9
Fluorescence	+	0.4 MCF-7 cells/μL	0-375 MCF-7 cells/μL	10
Fluorescence	+++	1 HeLa cell	1-3000 HeLa cells	11
Fluorescence	++	5 HeLa cells	5-1000 HeLa cells	12
Fluorescence	+++	1 HeLa cell	1-10^5 HeLa cells	13
Fluorescence	++	50 HeLa cells/mL	50-2000 HeLa cells/mL	14
Fluorescence	**+**	**2.18 HeLa cells/mL**	**3-530 HeLa cells/mL**	**This work**

The "+" in the table represents with the single amplification process, the "++" in the table represents with the double amplification process, the "+++" in the table represents with the triple amplification process and the "-" in the table represents without the amplification process.

Table S2. Comparison of different methods for TR detection

Signal readout	amplification	Detection Limit	Detection Range	Ref
cytometric	+	0.3 pM	0.001 - 5nM	15
Photoelectrochemical	+	17.0 fM	200 fM - 20 nM	16
Fluorescence	-	1.4 nM	0 - 2000 nM	17
Fluorescence	-	5.4 nM	0 - 250 nM	18
Fluorescence	+	2.7 pM	5 pM - 10 nM	19
Fluorescence	-	20 nM	25 nM - 250 nM	20
Fluorescence	**+**	**0.16 pM**	**5 pM - 50 nM**	**This work**

The "+" in the table represents with the single amplification process and the "-" in the table represents without the amplification process.

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