Supporting Information

Competition-Mediated FRET-Switching DNA Tetrahedron Molecular Beacon (CF-DTMB) for Intracellular Molecular Detection

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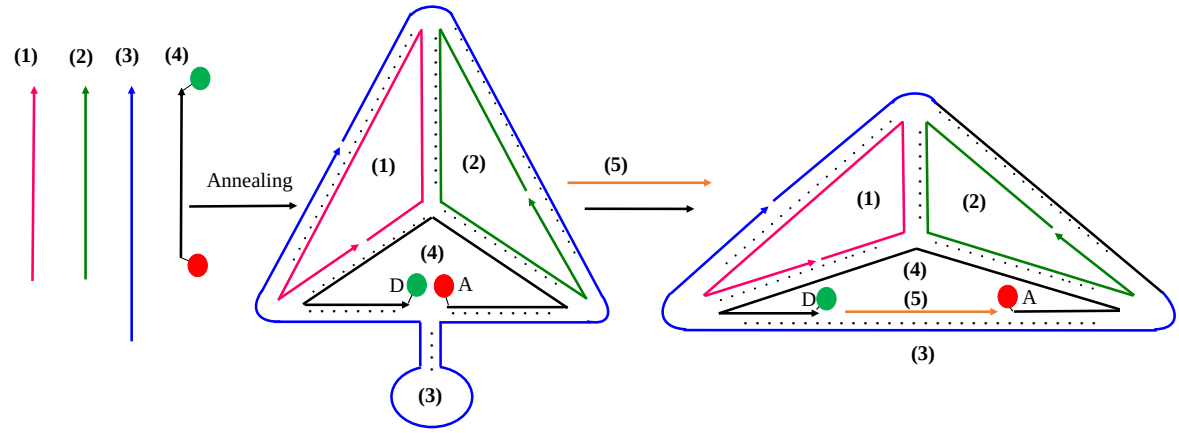
List of Tables and Figures

DNA Sequences

Number	Sequences (5'-3')
(1)	AGG CAG TTG AGA CGA ACA TTC CTA AGT CTG AAA TTT ATC ACC CGC CAT AGT AGA CGT ATC ACC
(2)	CTT GCT ACA CGA TTC AGA CTT AGG AAT GTT CGA CAT GCG AGG GTC CAA TAC CGA CGA TTA CAG
(3)	GGT GAT AAA ACG TGT AGC AAG CTG TAA TCG ATT TTA ATG CCA AAG ACA CTC GCT ACA TTG GCA TAA ATA ACT ACT ATG GCG
(4)	FAM-TAA AAA CGG TAT TGG ACC CTC GCA TGA CTC AAC TGC CTG GTG ATA CGA TAT TT-TAMRA
(5)	TGT AGC GAG TGT CTT TGG CAT ACT TGA TCA
(6)	TGA TCA AGT ATG CCA AAG ACA CTC GCT ACA
(7)	TGA TCA AGT ATT CCA AAG ACA CTC GCT ACA
(8)	GGT GAT AAA ACG TGT AGC AAG CTG TAA TCG ATT TTA ACC TGG GAA TAC TCC CCC AGG TAA ATA ACT ACT ATG GCG
(9)	ACC TGG GGG AGT ATT GCG GAG GAA GGT
(10)	ACC TGG GGG AGT ATT ACG TAG TAA CGT
TK1 forward	CTC CTA CCC ACT GGT CTG CTT A
TK1 reverse	CAG GGA GAA CAG AAA CTC AGC A
GAPDH forward	TGG GTG TGA ACC ATG AGA AGT
GAPDH reverse	TGA GTC CTT CCA CGA TAC CAA

Table S1. The DNA sequences used in this work.



Scheme S1. The assembly mechanism and process of the CF-DTMB.

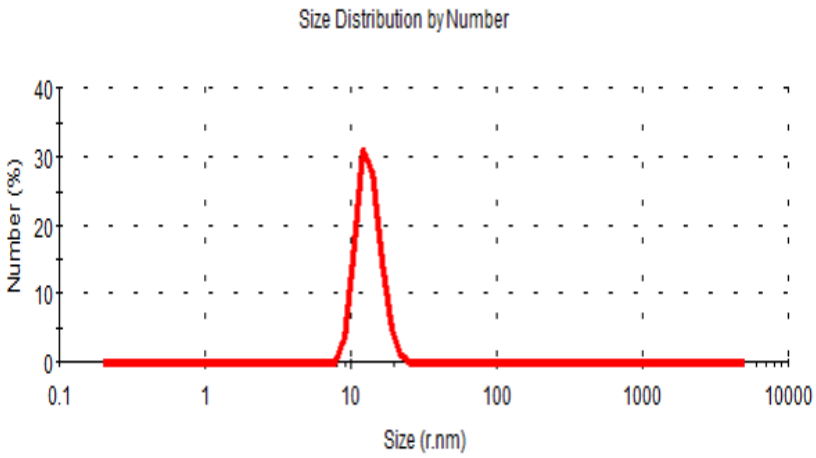


Figure S1. DLS measurement of CF-DTMB showed its hydrodynamic diameter of 14.3nm.

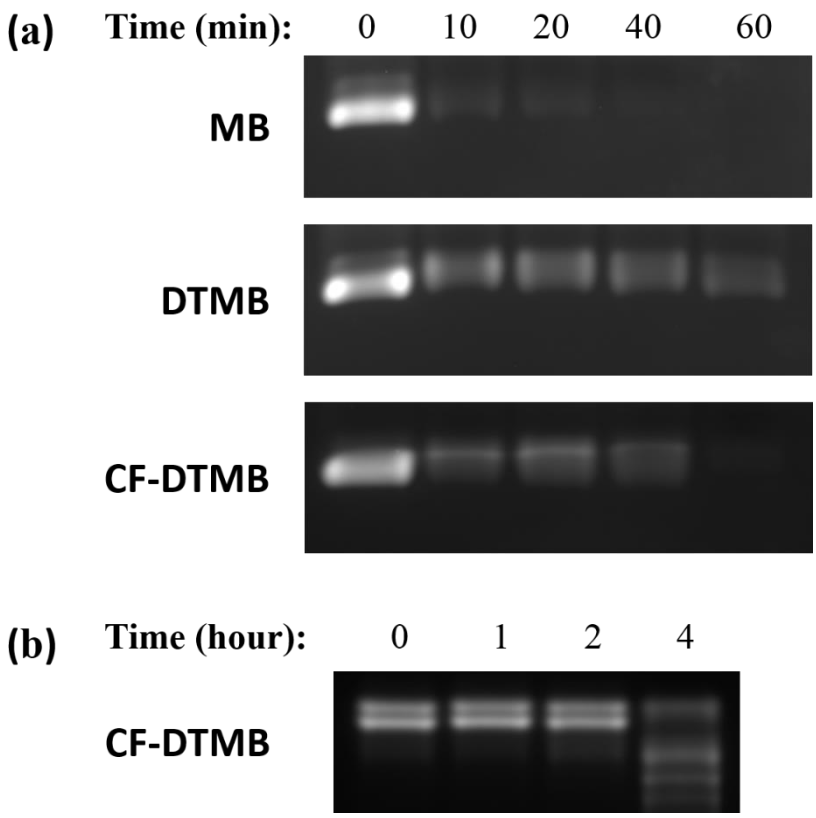


Figure S2. The nuclease resistance analysis of MB, DTMB and CF-DTMB by agarose electrophoresis. (a) Gel analysis of DNase I-treated samples with 0min, 10min, 20min, 40min and 60min incubation time, respectively. (b) Gel analysis of Exo III-treated CF-DTMB with 0h, 1h, 2h and 4h incubation time, respectively.

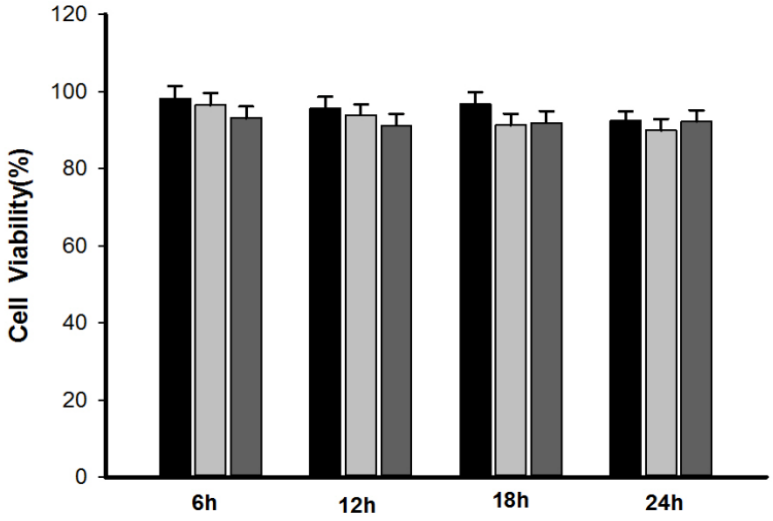


Figure S3. Cell viability assay (MTT assay). HepG2 cells were incubated with different concentrations of CF-DTMB for 6 h, 12 h, 18 h and 24 h. Black bar stands for 0 nM probes; light grey bar stands for 50 nM probes; dark gray bar stands for 100 nM probes.

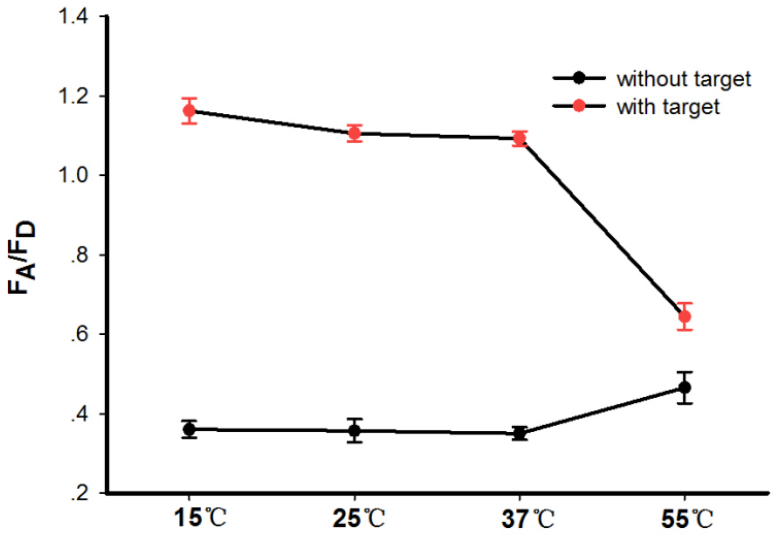


Figure S4. Thermodynamic studies of the CF-DTMB with or without target DNA.

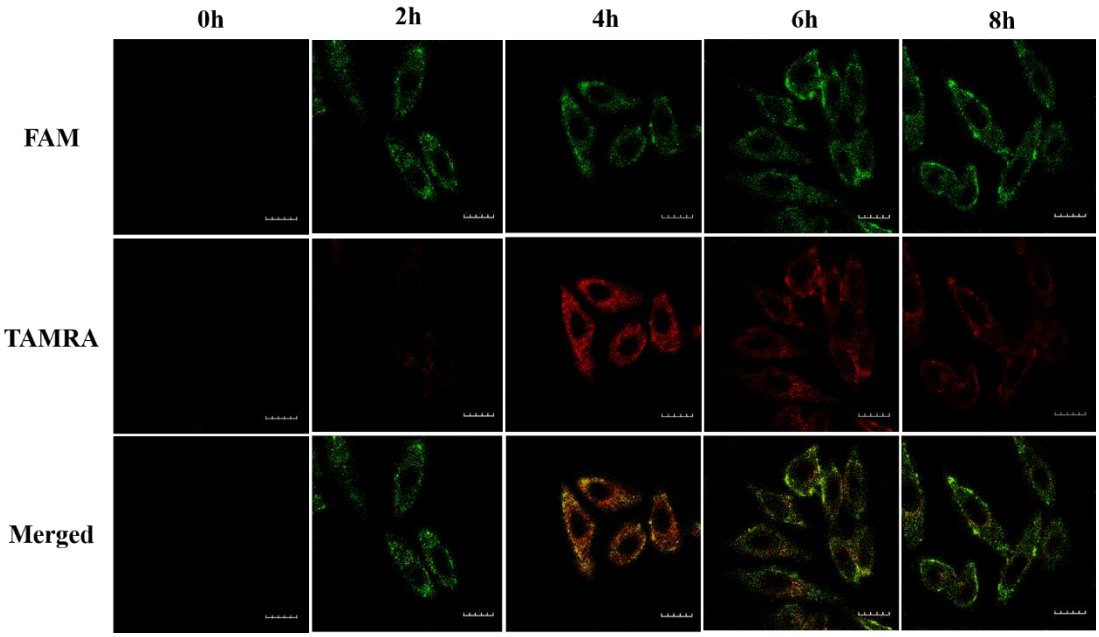


Figure S5. Optimization of the best imaging time for the CF-DTMB with living cells. HepG2 cells were incubated with 100 nM probes for different time point at 37℃ for confocal microscopy. Scale bars are 20 μm.

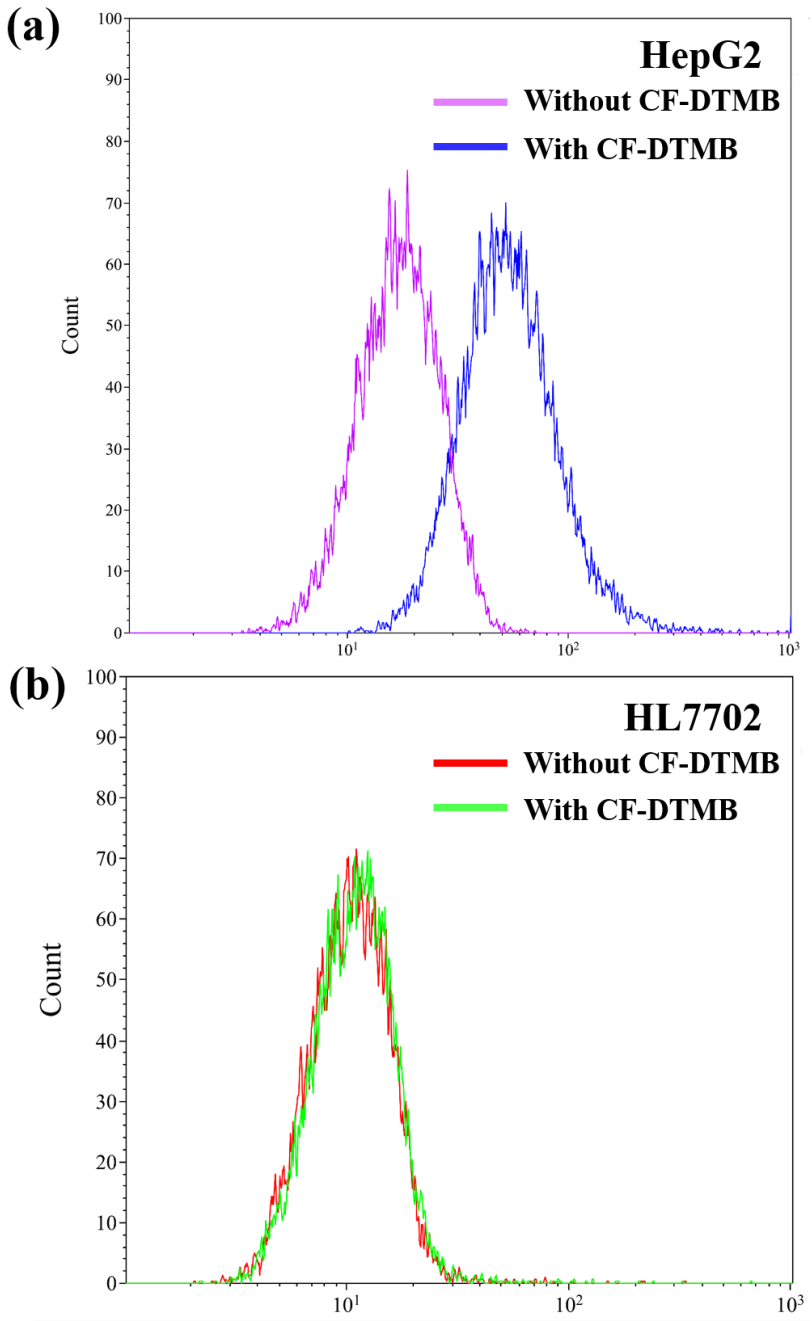


Figure S6. (a) and (b) were flow cytometry analysis of CF-DTMB incubated with HepG2 cells and HL-7702 cells, respectively.

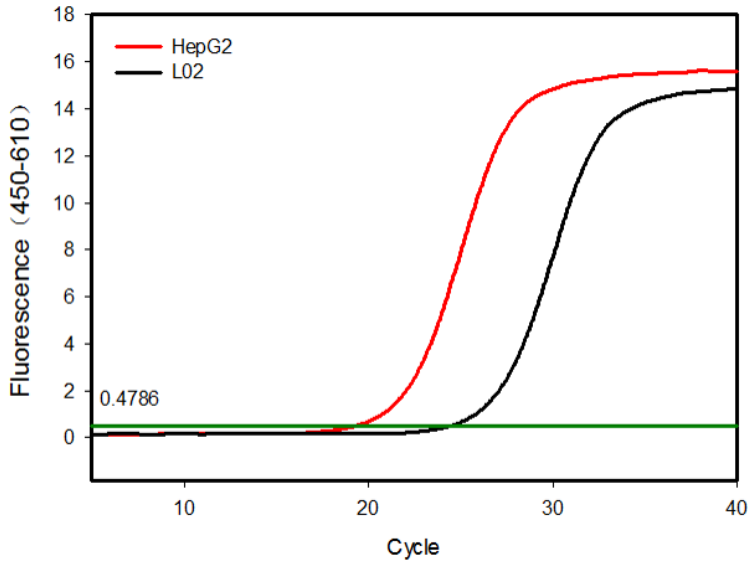


Figure S7. Analysis of Tk1 mRNA expressions in HepG2 and HL-7702 cells by qRT-PCR.

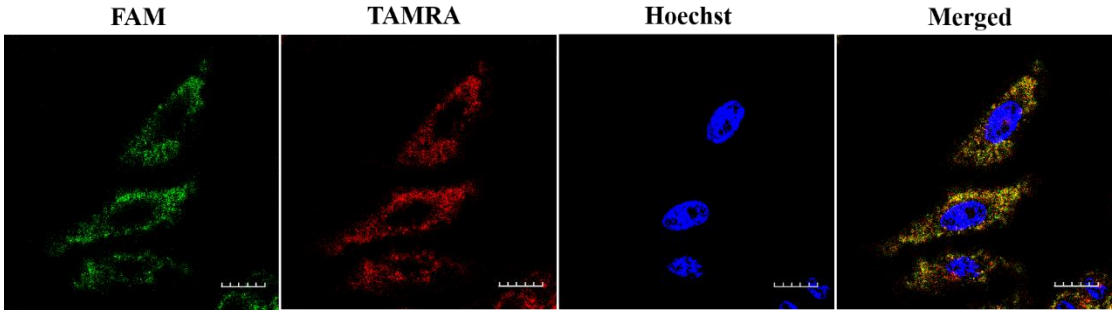


Figure S8. Co-localization analysis of the CF-DTMB by confocal microscopy. Cell nucleus was counterstained with Hoechst dye (blue). Green channel and red channel were collected under the excitation of 488nm. Scale bars were 20 μm.