

Supporting Information

1. The sequence

Table S1. The sequence used in this work.

Name	Sequence	5'mod	3'mod
H1	GTCAGTGA_GCTAGGTT_AGATGTCG_CCATGTGTAGA _CGACATCT_AACCTAGC_CCTTGTCA		
H2	AGATGTCG_TCTACACATGG_CGACATCT_AACCTAGC _CCATGTGTAGA_AAGGAGTGTGTGTGCGTGC		
C1	CGACATCT_AACCTAGC_TCACTGAC		
RepF	CGA_GTGCTCTA_TGACAAGG_GCTAGGTT	FAM	
RepQ	C_CCTTGTCA_TAGAGCAC_TCG		IBFQ
In	CCATGTGTAGA_AAGGAGTGTGTGTGCGTGC		
H1-FAM	GTCAGTGA_GCTAGGTT_AGATGTCG_CCATGTGTAGA _CGACATCT_AACCTAGC_CCTTGTCA	FAM	
H2-FAM	AGATGTCG_TCTACACATGG_CGACATCT_AACCTAGC _CCATGTGTAGA_AAGGAGTGTGTGTGCGTGC	FAM	
H3	AGGAGTGTGAGTGC GTGCGAAAAGGCACGCACTCAC ACTCCTTTCTACCTTTTTTTTTTTTC		
H4	CCTTTTCGCACGCACACTCACTCCTGTAGAAAGGAGT GTGAGTGC GTGCTTTTTTTTTTTTC		
H3-FAM	AGGAGTGTGAGTGC GTGCGAAAAGGCACGCACTCAC ACTCCTTTCTACCTT	FAM	
H4-FAM	CCTTTTCGCACGCACACTCACTCCTGTAGAAAGGAGT GTGAGTGC GTG	FAM	
G1	CTGGGAGGGAGGGAGGGA_AAAAAAAAAAAG		
Bio-Antisense	TGACAAGG_GCTAGGTT	Biotin	
FAM-AC	AACCTAGC_CCTTGTCA	FAM	

2. The kinetics of CHA

Figure S1. The CHA system's kinetic characterization. (a) Different concentrations of Catalyst and Hairpins from 1 to 5 were: 5 nM, 1 nM, 0.5 nM, 0 nM, 0 nM. Except for curve 5 which has no hairpins added, the hairpin of H1 and H2's concentration were: 50 nM and 400 nM, respectively. All the reactions were involved with 50 nM reporter; (b) The electrophoresis result of HCR with different concentrations and reaction time: From left to right (1 to 8) the reaction time for HCR: overnight (without In), 30 min, 1 h, 2 h, 3 h, 4 h, 5 h and 6 h with the H1 and H2 consistently 200 nM respectively except for lane 1.

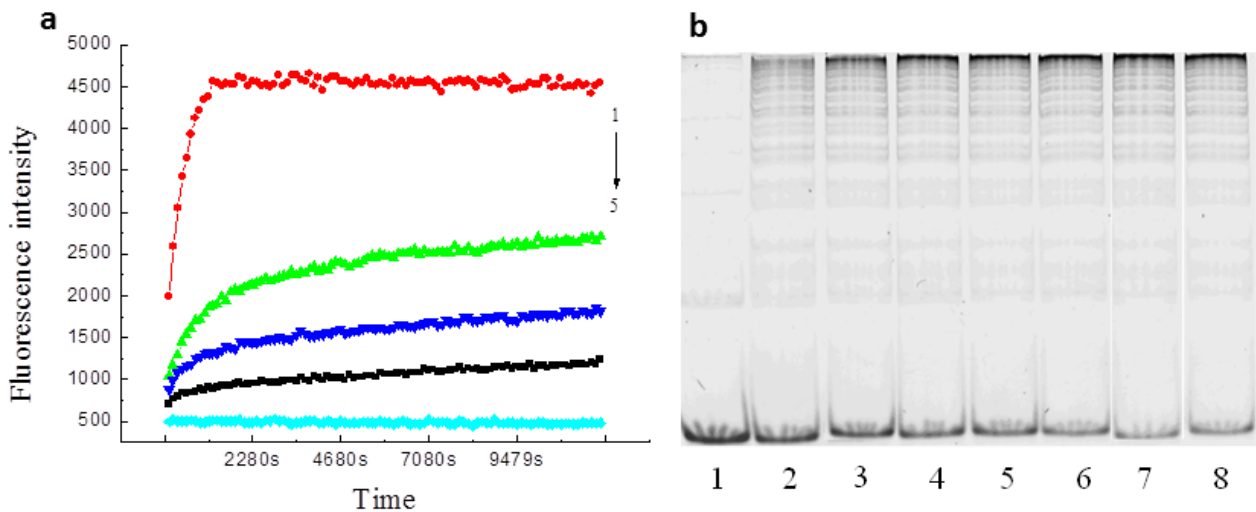


Figure S2. Concentration dependence of G1's homogenous reaction with HPA, with pH 8.5, 1 mM H₂O₂, 20 mM HPA, 5 nM hemin at 37 °C.

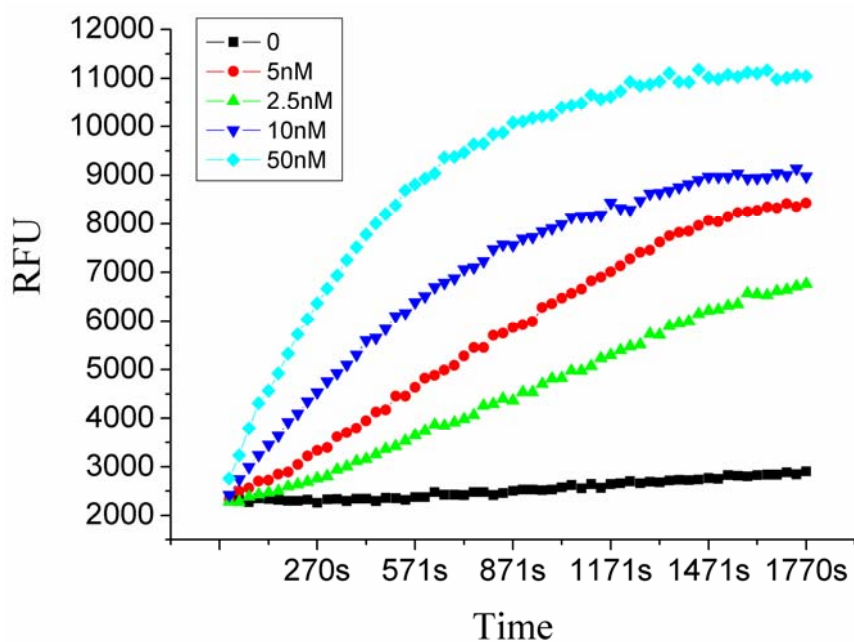


Figure S3. Fluorescent kinetic measurement with CHA-HCR-DNAzyme amplification with different concentrations of C1.

