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Electronic Supplementary Information

Cleavage-based Hybridization Chain Reaction for Electrochemical Detection of Thrombin

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Table S1. Comparisons of proposed aptansensor with other detection methods for thrombin analysis

Analytical method	Linear range (nM)	Detection limit	Ref.
DPV	0.001~10	0.34 pM	1
DPV	0.001~0.1	1 pM	2
DPV	0.8~15	0.2 nM	3
DPV	0.01~0.1	42.2 pM	4
DPV	0.05~40	3 pM	5
DPV	6~60	3 nM	6
DPV	0.5~40	0.093 nM	7
DPV	0.0001~50	0.05 pM	This work

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Gel Electrophoresis.

All the oligonucleotides were heated to 95°C for 2 min and then allowed to cool to room temperature for 1 h before use. A_1 (2μM), A_2 (2μM) and the mixture of 2μM A_1 and A_2 was incubated in buffer solution for 100 min respectively. The 1% agarose gels were prepared by using 1×TAE buffer. The gel was run at 100 V for 30 min, visualized under UV light and finally photographed with a digital camera.

Fig. S1. Agarose gel electrophoresis demonstration of A_1 and A_2 initiated HCR: lane 1, 2μM A_1; lane 1, 2μM A_2 ; lane 3, the mixture of 2μM A_1 and A_2 . HCR time:100min.

The HCR between two helpers A_1 and A_2 was further examined by gel electrophoresis. In the absence of A_2, the buffer solution (contain A_1) observed one emission band after 100 min of gel electrophoresis (shown in Figure S1, lane 1). When A_2 was in the buffer solution without A_1, the same result appeared (shown in

Figure S1, lane 2). Once A_1 and A_2 were introduced at the same time, the two helpers could form dsDNA polymer *via* complementary base pairing. In this case, the emission band of high-molecular weight structures can be observed (displayed in Figure S1, lane 3), indicating the successful growth of dsDNA polymer.