SUPPORTING INFORMATION

Sensitive, Selective and Label-free Protein Detection Using A Smart Polymeric Transducer and Aptamer/Ligand System

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Experimental Section

Materials and instrumentation. Nanopure water (18.2 MΩ; Millpore Co., USA) was used in all experiments and to prepare all buffers. Human α-thrombin was obtained from Sigma. Genefinder^{TM} was purchased from Bio-v Company (Xiamen, China). The molecular structure and concentration of Genefinder are proprietary. The producer defined the concentration of Genefinder as 10000×. We used it after serial dilution. PFP was synthesized according to the literature (Adv. Mater. 2002, 14, 361). The molecular weight and polydispersity of the PFP is 25000 and 2.1. All of the oligonucleotides used in this paper were synthesized by Sangon Biotechnology Inc. (Shanghai, China). The sequences are as follows:

The anti-thrombin aptamer, A1:

5'-CAC TGT GGT TGG TGT GGT TGG-3';

The partly complementary sequence, C2:

5'-CCA ACC ACA GTG -3';

The UV-Vis absorption spectra and fluorescence spectra were recorded using a JASCO V-550 UV/Visible and a JASCO FP6500 spectrophotometer (JASCO International Co., LTD., Tokyo, Japan).

The assay of protein detection: A mixture of 21mer anti-thrombin aptamer (A1) and 12mer complementary sequence (C2) in 25 mM Tris-HCl buffer (50 mM NaCl, 5 mM $MgCl_2$. pH 7.4) was heated to 90℃ for 3 minutes, and then was cooled to room temperature slowly. The solutions were subsequently incubated with various amounts of protein for 5h at room temperature. After a specific time, PFP ([PFP] =2.0 μM in RUs (repeated units)) and 0.01× Genefinder (In this study, we define the

concentration of Genefinder obtained from Bio-v company (Xiamen, China) as 10000×) were added to the solutions. Then fluorescence intensity was measured to quantitatively determine the amounts of thrombin present. The excitation wavelength was at 380 nm and the spectra were collected in the range of 390 to 650 nm.

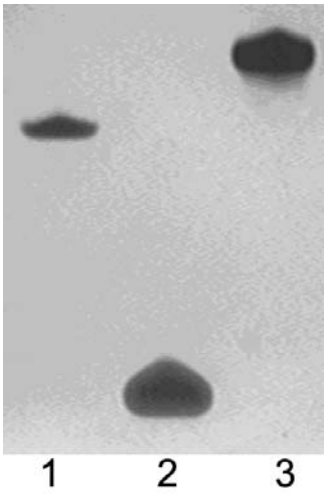

Figure S1. Gel electrophoresis analysis of DNA. Lane1. 21mer (A1), Lane2. 12mer (C2), Lane3. A1+C2.

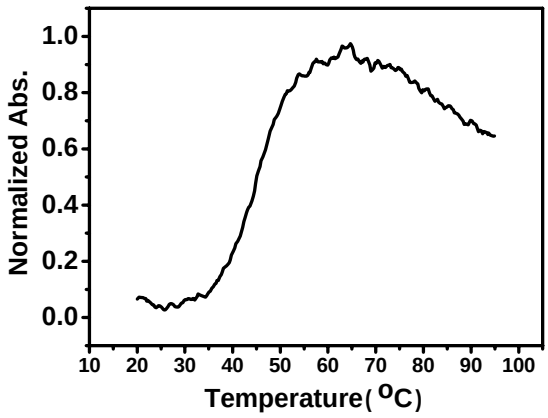

Figure S2. UV thermal denaturation study shows the formation of the stable duplex at room temperature.