Electronic Supplementary Material (ESI) for Analyst.

Supporting Information

DNA-Programmed Plasmonic ELISA for the Ultrasensitive Detection of Protein Biomarkers

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Table of Contents

Table S1. Sequences of synthesized DNA probes.

Name	Sequences (5'-3')
Biotinylated DNA probe	Biotin-TTT TTT TCT CAA GGA CCA CCG CAT CTC TAC
Hairpin probe H1	GTA GAG ATG CGG TGG TCC TTG AGA CAA AGT TCT CAA GGA CCA CCG CAT TTT TTT TTT TGT ACT CAA TGT CCA GTC TCT AG
Hairpin probe H2	TCT CAA GGA CCA CCG CAT CTC TAC ATG CGG TGG TCC TTG AGA ACT TTG
Hairpin probe H3	TTT TTT TTT TTT TTT CTA GAG ACT GGA CAT TGA GTA CCT TGT GTA GCT CGT ACT CAA TGT CCA
Hairpin probe H4	TTT TTT TTT TTT TTT ATG AGT ACG AGC TAC ACA AGG TAC TCA ATG TCC ACT TGT GTA GCT C
Thiolated DNA probe	SH-AAA AAA AAA AAA AAA AAA AAA

The red letter in biotinylated DNA probe and hairpin probe H1 indicates the complementary sequences, green letter in hairpin probe H1 indicates the toehold region fot initiating catalyzed chain reaction with hairpin probe H3. The blue letter in hairpin probe H3, hairpin probe H4 and thiolated DNA probe indicates complementary sequences. The underline sequences indicate spacer region.

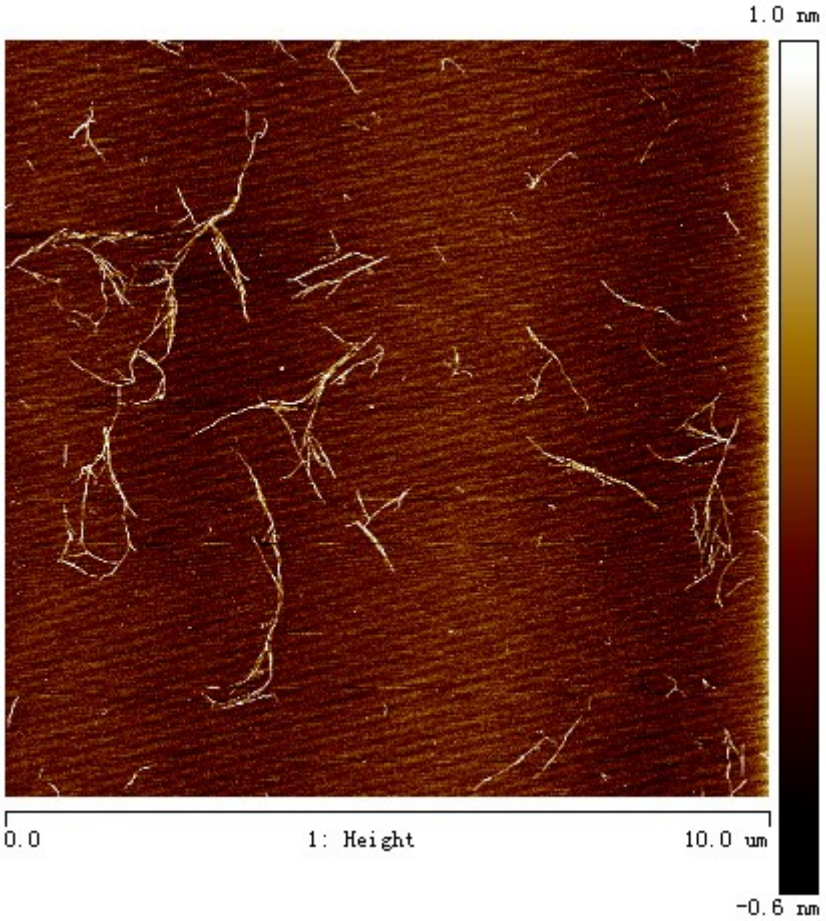

Figure S1. The AFM images show the polymerization of the 10 μM H1 and10 μM H2 hairpin pair with 100 nM DNA initiator.

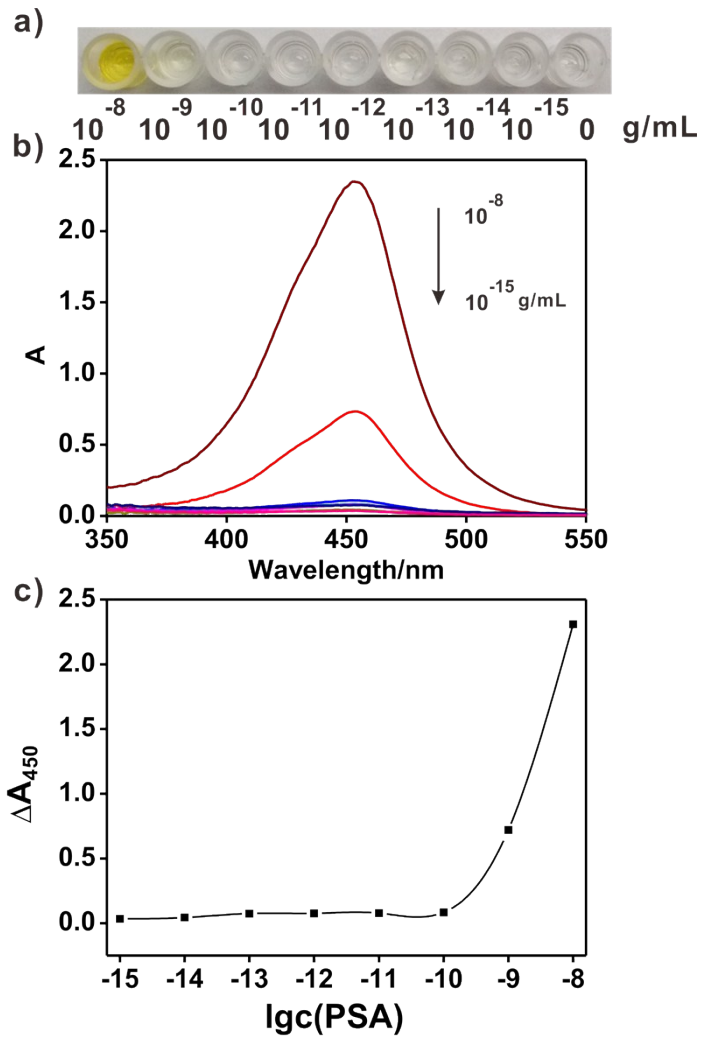

Figure S2. Conventional colorimetric ELISA for PSA detection utilzing HRP as enzyme lable and TMB as substrate. Colors of the solution (a), corresponding absorption spectrum (b) and corresponding ΔA450 (c) with PSA concentrations in the range from 10^{-15} to 10^{-8} g/mL.

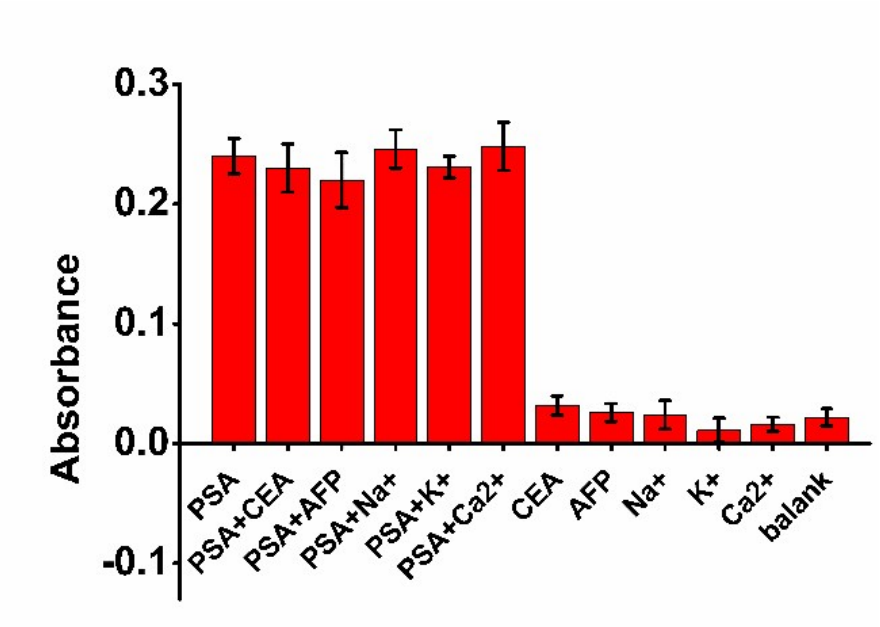

Figure S3 Selectivity investigation for PSA (10^{-10} g/mL) in the presence of 10^{-9} g/mL a) CEA, b) AFP, c) calcium ions, d) sodium ions, e) potassium ions and f) blank in 10 % fetal bovine serum. Error bars indicate the standard deviation of three independent measurements.

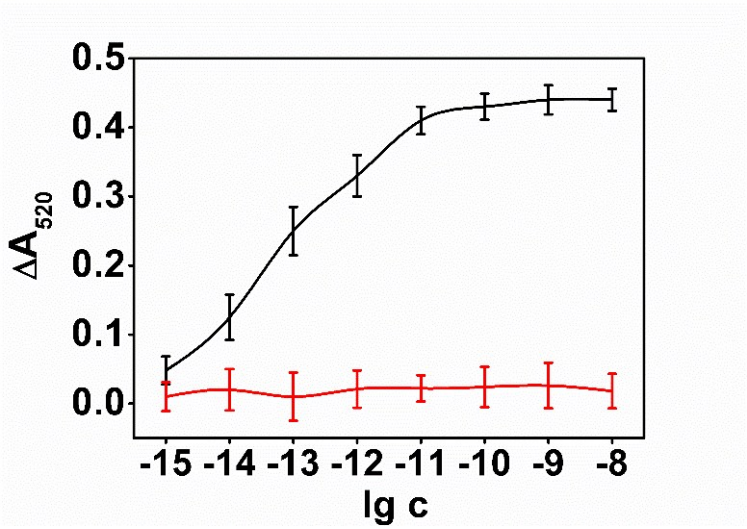

Figure S4 Measurement of PSA concentration in 10 % serum by the developed method. Black curve was obtained by spiking different concentrations of PSA into 10 % fetal bovine serum (10^{-15} to 10^{-8} g/L). Red curve was obtained by spiking the unrelated protein BSA. Error bars indicate the standard deviation of three independent measurements.