Electronic Supplementary Material (ESI) for RSC Advances.

Resonance Rayleigh scattering detection of trace PDGF based on catalysis of aptamer-modified nanogold probe on the Fehling reaction

Yanghe Luo[§], Xinghui Zhang[§], Dongmei Yao, Guiqing Wen, Qingye Liu, Aihui Liang[*], Zhiliang Jiang*

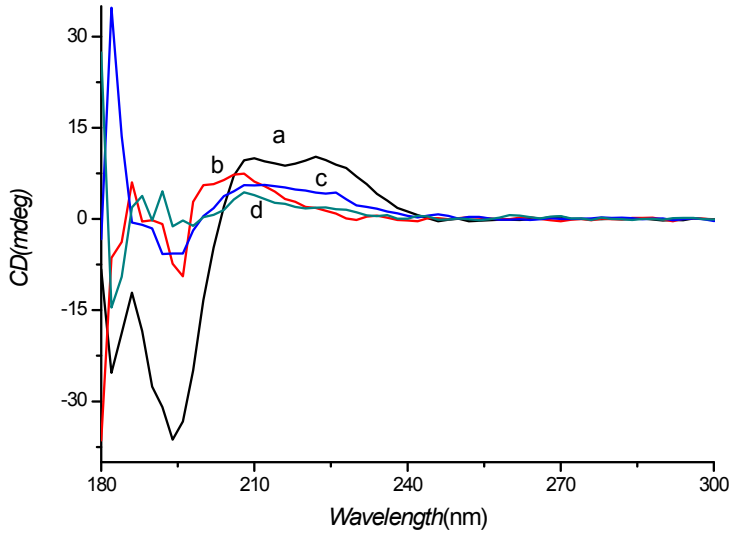

Figure 1S Circular dichroism spectra of the Apt-GN- PDGF-AA system
a: 1.51μg/mL Apt-GN; b: 1.51μg/mL Apt-NG-6.67μg/mL BSA- pH7.2 Na_2HPO_4-NaH_2PO_4-5.33 mmol/L NaCl; c:b-6.67ng/mL PDGF-AA; d:b-26.67ng/mL PDGF-AA

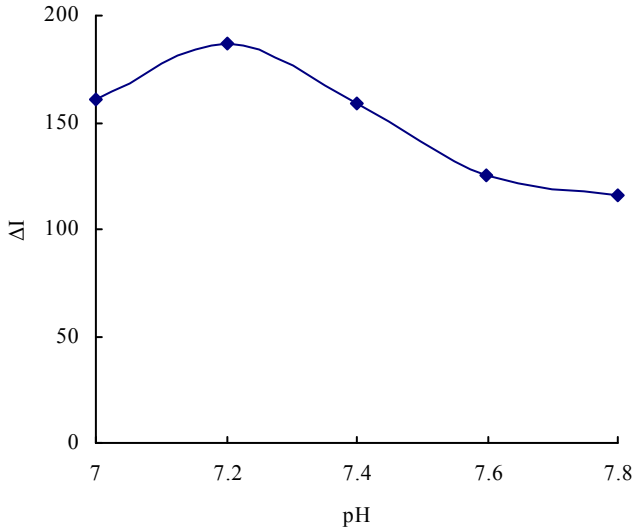

Figure 2S. Effect of pH value
1.86μg·mL^{-1} Apt –NG+6.67 μg·mL^{-1} BSA+20 ng·mL^{-1} PDGF

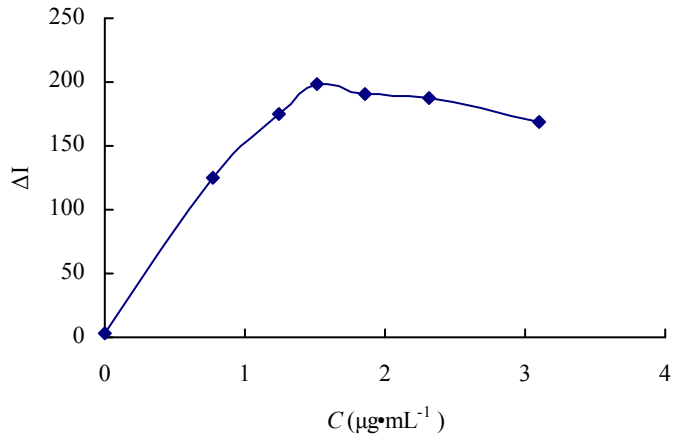

Figure 3S. Effect of Apt-NG concentration
6.67μg·mL^{-1} BSA-pH7.2 Na_2HPO_4-NaH_2PO_4+5.33 mmol·L^{-1} NaCl+20 ng·mL^{-1} PDGF

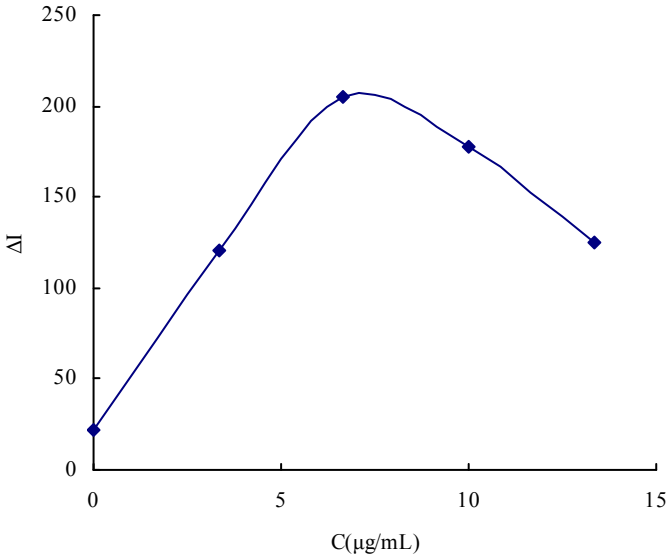

Figure 4S. Effect of BSA concentration

1.86 μg·mL^{-1} Apt-NG-pH 7.2 Na_2HPO_4-NaH_2PO_4-5.33 mmol·L^{-1} NaCl-20 ng·mL^{-1} PDGF

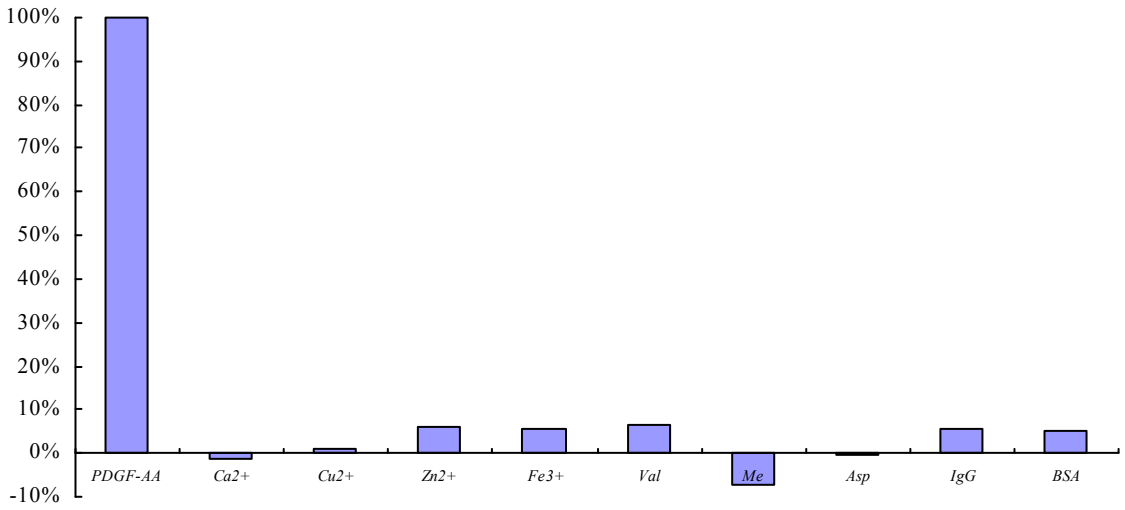

Figure 5S Effect of foreign substances

Table 1S Comparing of some methods for PDGF

Method	Principle	LR (nmol/L)	DL (pmol/L)	Comments	Ref.
EC	Upon addition of PDGF-BB, MB modified Apt is thought to fold into a configuration that forces the MB label into proximity with the electrode, leading to improved electron-transfer efficiency.	-	50	selective	[7]
CL	In the presence of PDGF-BB, the Apt can hybridize stably with the capture DNA to form a stem-loop structure leading to a strong CL.	0.00005-0.5	0.01	very sensitive and simple	[10]
FR	The fluorophore DMDAP was brought close to NG, thus its FR was quenched. Upon PDGF-AA binding, the conformation of Apt changed and therefore block of the DMDAP intercalation, making the FR restored.	0-30	8	sensitive and selective	[3]
FR	Based on the release of an intercalating dye from the Apt stem structure during deformation when the Apt captures PDGF, result in FR quenching.	-	1	sensitive and selective	[16]
CM	Interparticle cross-linking of NG was induced by PDGF that acted as bridges linking Apt-NG together. But the cross-links of NG decreased in the presence of high-concentration PDGF due to repulsion and steric effects resulted from saturated NG surfaces.	PDGF-AA:25-75 PDGF-BB:35-150 PDGF-AB:15-100	——	simple	[9]
Sensor	The Apt immobilized on a SGFET diamond surface, upon introduction of PDGF to the immobilized Apt, result in electrostatic changed.	-	-	simple	[6]
PRRS	Apt-GN combined with PDGF-AA to form big cluster, and Apt-GN had catalysis of the Cu_2O particle reaction.	0.0014-1.20 (0.03-26.67 ng/mL)	0.47	Sensitive and simple	This assay

*EC-electrochemistry, CL-chemiluminescence, CM-colorimetry, FR-fluorescence, MB-methylene blue, DMDAP-N,N-dimethyl-2,7-diazapyrenium.

Table 2S Analytical result of the PDGF samples

Sample	Single value (ng/mL)	Average (ng/mL)	Added PDGF-AA (ng/mL)	Recovery (%)	RSD (%)	ELISA (ng/mL)
1	10.2, 9.00, 9.60, 10.8, 9.50	9.80	10.0	98.1	6.9	9.95
2	9.80, 9.50, 9. 30, 11.0, 9.30	9.80	10.0	97.8	7.2	10.5
3	10.1, 9.60, 9.40, 9.60, 9.50	9.60	10.0	96.3	3.1	9.68