Supporting Information

# Highly sensitive electrochemical IFN-γ aptasensor based on hierarchical graphene/AuNPs electrode interface with a dual enzyme-assisted amplification strategy

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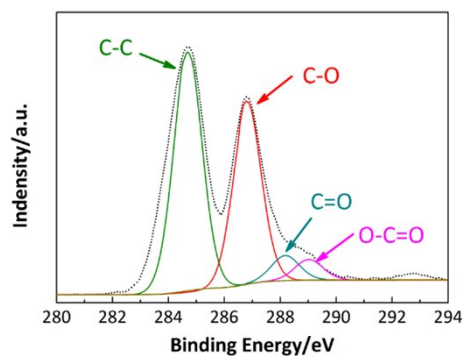
Fig. S1 The C1s XPS spectrum of GO.
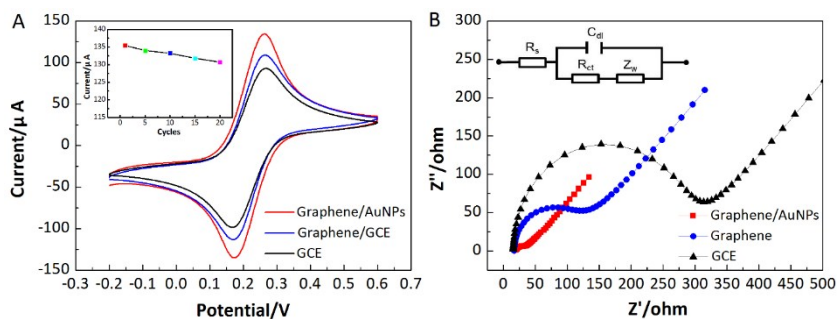
Fig. S2 (A) Cyclic voltammograms of bare GCE, graphene and graphene/AuNPs modified GCE at a scan rate of 50 mV s^{-1}. Inset is the stability test with consecutive 20 cycles. (B) Nyquist diagrams of bare GCE, graphene and graphene/AuNPs modified GCE recorded from 0.1 Hz to 100 kHz. Inset is the related equivalent circuit.
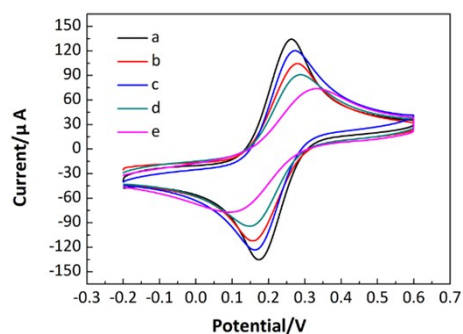
Fig. S3 Cyclic voltammograms of different interfaces, (a) graphene/AuNPs modified electrode, (b) duplex DNA strands and TH molecules immobilized electrode, (c) in the presence of IFN-γ and RecJf exonuclease, (d) hybridization with linker probes, (e) incubation with reporter probes.
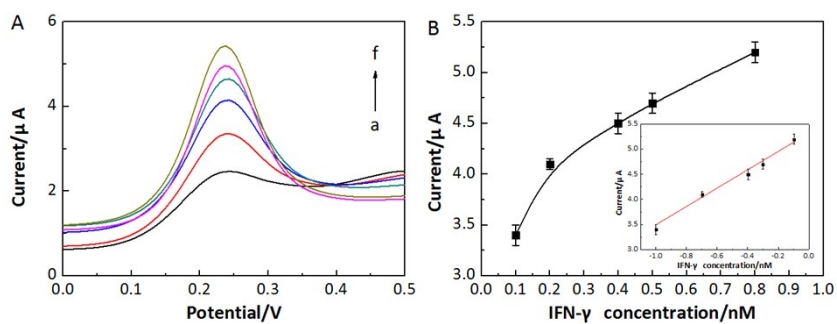
Fig. S4 (A) DPV responses of the aptasensor after the incubation with different IFN-γ concentrations (from a to f, 0, 0.1 nM, 0.2 nM, 0.4 nM, 0.5 nM and 0.8 nM respectively). (B) Calibration curve corresponding to peak currents of different IFN-γ concentrations. Inset: the linear relationship between peak currents vs the logarithm of IFN-γ concentrations.

Table S1 Sequences of oligonucleotides used in this work.

DNA	Sequence (5′→3′)
Capture probe	SH/NH$_2$-(CH$_2$)$_6$- GGG TTG GAC ACA ACA CCC AAC ACA ACC AAC CCC
Aptamer	AAA GGG GTT GGT TGT GTT GGG TGT TGT GTC CAA CCC C
Linker probe	Biotin-TAG CTT TAG AGA CTG ATG TTG A GGG GTT GGT TGT GTT GGG TGT TGT GTC
Reporter probe-I	Biotin-T CAA CAT CAG TCT CTA AAG CTA CCA TGT GTT AGC TTT AGA GAC T
Reporter probe-II	Biotin-T AGC TTT AGA GAC TGA TGT TGA AGT CTC TAA AGC TAA CAC ATG G

Table S2 Performance comparison of various electrochemical IFN-γ aptasensors.

Methods	Techniques	Linear range	Detection limit	Detection time	References
Electro -chemical	SWV	0.06–10 nM	60 pM	~0.5 h	17
	CV	0.1–100 nM	0.1 nM	~1 h	18
	SWV	0.01–10 nM	1.14 pM	~2 h	55
	DPV	0.5–300 nM	0.3 nM	~5.5 h	56
	SWV	0.06–29.6 nM	77 pM	/	57
	EIS	0.02–0.11 nM	11.56 pM	~0.5 h	58
	DPV	50 fM–3.0 pM	16.3 fM	~3.5 h	59
	DPV	0.005–5 nM	2 pM	~5 h	This work

[a]Detection time is calculated from the IFN-γ injection to the readout of the response signal.

References

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