

1 **Electrochemical immunosensor of prostate specific antigen**
2 **detection using nitrogen-doped graphene as sensing platform**

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4 Wenwen Meng, Wenjuan Zhang, JunJun Zhang, Xi Chen, Yuzhong Zhang*

5 *College of Chemistry and Materials Science, the Key Laboratory of Functional Molecular Solids, Ministry*

6 *of Education, Anhui Key Laboratory of Chem-Biosensing, Anhui Normal University, Wuhu 241000,*

7 *People's Republic of China*

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19 * Corresponding author. Tel.: +86 553 3869303; Fax: +86 553 3869303

20 E-mail address: zhyz65@mail.ahnu.edu.cn (Y. Zhang).

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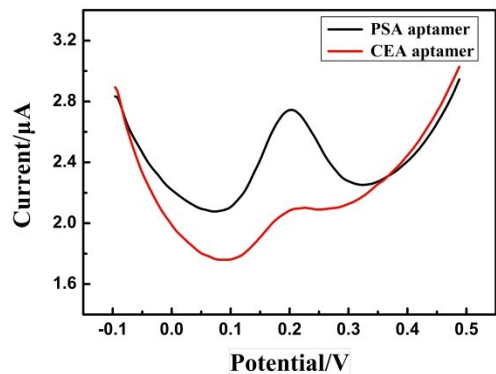


Fig. S1 Investigation of two different aptamers for PSA recognition ability.

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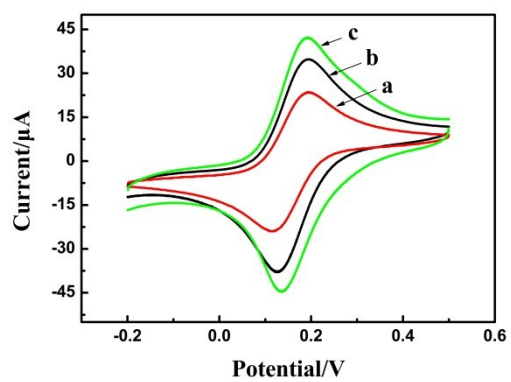
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60 **Fig. S2** CVs of the immunosensor modified with different materials in 1.0 mM $[\text{Fe}(\text{CN})_6]^{3-/4-}$ containing 0.1

61 M KCl. Curves:(a) GCE; (b) GO/GCE; (c) NG/GCE.

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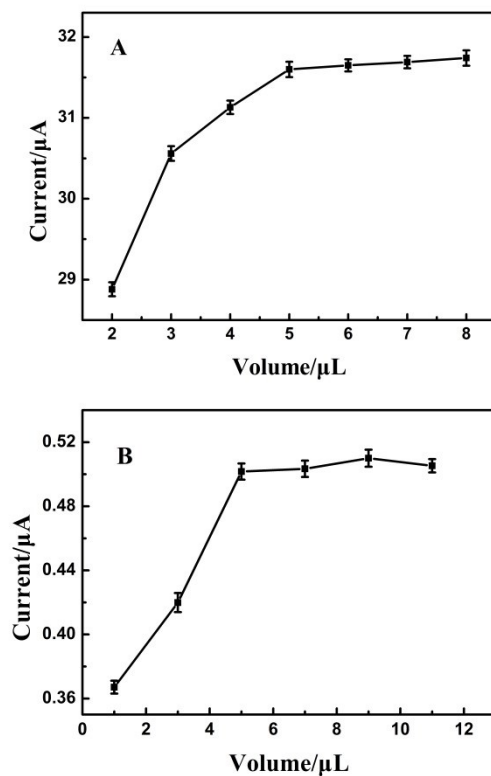
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76 **Fig. S3** (A) The effect of amount of NG on the oxidation peak current of 1.0mM [Fe(CN)₆]^{3-/4-}; (B) The

77 effect of amount of signal probe on signal intensities of immunosensor. Conditions: C_{PSA}=1.0 ng mL⁻¹;

78 C_{aptamer} = 1.0 μM; C_{NG} =1.0 mg mL⁻¹.

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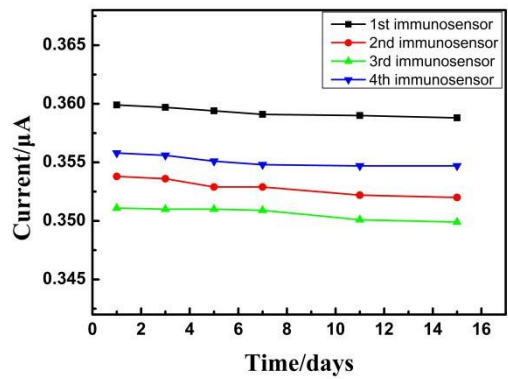


Fig. S4 Stability of immunosensor

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Table. S1 Analytical performances of various PSA assays.

Detection method	Recognition element	Linear range (ng mL ⁻¹)	Detection limit (ng mL ⁻¹)	References
Electrochemical	Biotinated aptamer	0.25 ~ 200	0.25	[7]
Fluorescence	Dye-labeled aptamer	0.50 ~ 300	0.2	[25]
Electrochemical	Aptamer	0.125 ~ 200	0.05	[28]
Electrochemical	Aminated aptamer	1 ~ 100	1.0	[44]
Electrochemical	Aptamer-MIP hybrid receptor	0.10 ~ 100	0.001	[45]
Electrochemical	Antibody	0.05~50	0.015	[46]
Electrochemical immunoassay	Antibody	0.01 ~ 10	0.002	[47]
Chemiluminescence	Dye-labeled aptamer	1.9 ~ 125	1.0	[48]
Colorimetric assay	PSA peptide	0.1 ~ 100	0.1	[49]
Surface plasmon resonance	Aptamer beacon	0.1 ~ 50	0.091	[50]
Electrochemical	Aptamer	1 ~ 300	0.28	[51]
Electrochemical	Antibody- Aptamer	0.05 ~ 100	0.017	This work

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Table. S2 Recovery results of PSA in serum samples using the proposed aptasensor

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	Amount added (ng mL ⁻¹)	Amount detected ^a (ng mL ⁻¹)	Recovery (%)	RSD (%)
1	0.10	0.099±0.006	99.0	6.06
2	0.50	0.507±0.030	101.4	5.92
3	1.00	0.968±0.050	96.8	5.17

103 ^aThe average value ± standard deviation of five measurements

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