Electronic Supplementary Material (ESI) for RSC Advances

Electronic Supporting Information (ESI†)

Nanostructured palladium-reduced graphene oxide platform for high sensitive, label free detection of cancer biomarker

Vinod Kumar, Saurabh Srivastava, Sima Umrao, Ram Kumar, Gopal Nath, Gajjala Sumana, Preeti S. Saxena* and Anchal Srivastava*

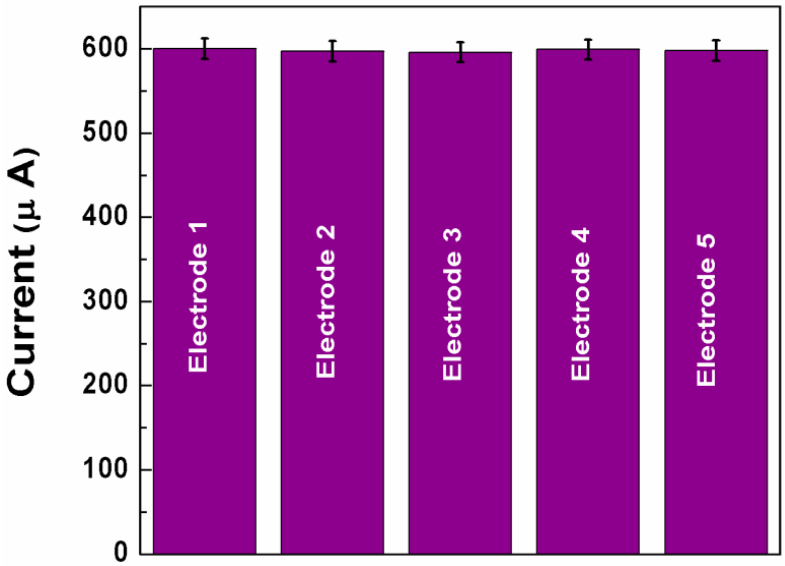

Fig. S1 CV response of different BSA-anti-PSA/Pd@rGO/ITO immunoelectrodes fabricated via the same set of procedure with PSA (1 ng/ml), conducted in PBS (pH 7.4) containing 5 mM [$\{Fe(CN)_6\}^{3-/4-}$]

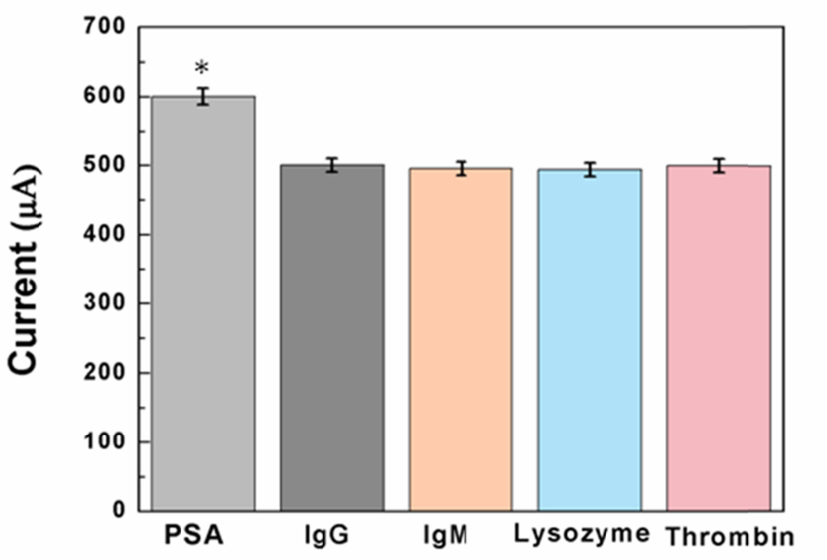

Fig. S2 CV response of BSA-*anti*-PSA/Pd@rGO/ITO immunoelectrode in the presence of IgG, IgM, lysozyme and thrombin (ANOVA, *p<0.05)

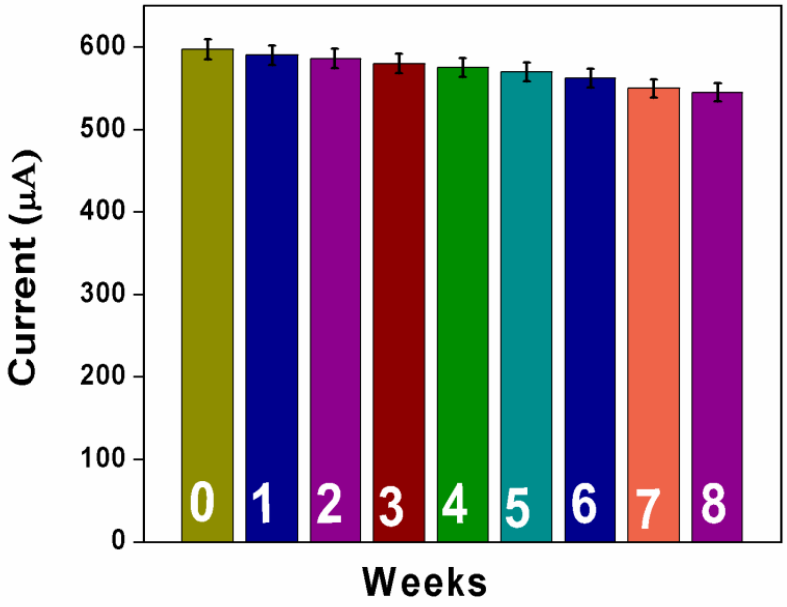

Fig. S3 CV response of BSA-*anti*-PSA/Pd@rGO/ITO electrode measured at a regular interval of one week conducted in PBS

Table S1. Comparison of performance of some electrochemical immunosensors for the detection of PSA

Modified electrodes	**Linear range (ng/ml)**	**Detection limit (ng/ml)**	**Reference**
Alkaline phosphatase modified Si nanoparticles	1-33	0.76	[1]
HRP	1-40	1	[2]
HRP modified carbon nanotube	0.4-40	0.004	[3]
Quantum dot	0.05-4	0.02	[4]
Dumbbell-like Au-Fe_3O_4 nanoparticles	0.01–10	0.005	[5]
Ionic liquid–carbon nanotubes modified electrode	0.2–1.0 and 1–40	0.020	[6]
Hollow mesoporous silica microspheres	0.01–10	0.006	[7]
Graphene/methylene blue Nanohybrid	0.05–5.00	0.013	[8]
Pd@rGO /ITO	0.01-12.5	0.01	**Current work**
rGO/ITO	0.1-12.5	0.1	

References

1. B. Qu, X. Chu, G. Shen, and R. Yu, *Talanta*, 2008, **76**, 785–90.
2. B. V Chikkaveeraiah, A. Bhirde, R. Malhotra, V. Patel, J. S. Gutkind, and J. F. Rusling, *Analytical chemistry*, 2009, **81**, 9129–34.
3. X. Yu, B. Munge, V. Patel, G. Jensen, A. Bhirde, J. D. Gong, S. N. Kim, J. Gillespie, J. S. Gutkind, F. Papadimitrakopoulos, and J. F. Rusling, *Journal of the American Chemical Society*, 2006, **128**, 11199–205.
4. G. Liu, Y.-Y. Lin, J. Wang, H. Wu, C. M. Wai, and Y. Lin, *Analytical chemistry*, 2007, **79**, 7644–53.
5. Q. Wei, Z. Xiang, J. He, G. Wang, H. Li, Z. Qian, and M. Yang, *Biosensors & bioelectronics*, 2010, **26**, 627–31.
6. A. Salimi, B. Kavosi, F. Fathi, and R. Hallaj, *Biosensors & bioelectronics*, 2013, **42**, 439–46.
7. D. Wu, R. Li, H. Wang, S. Liu, H. Wang, Q. Wei, and B. Du, *The Analyst*, 2012, **137**, 608–13.
8. K. Mao, D. Wu, Y. Li, H. Ma, Z. Ni, H. Yu, C. Luo, Q. Wei, and B. Du, *Analytical biochemistry*, 2012, **422**, 22–7.