Electronic Supplementary Materials for

Signal-on electrochemical immunosensor using ionic liquid doped Au nanoparticle/graphene as a nanocarrier and alkaline phosphatase as enhancer

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Zeta potential analysis was used to characterize the fabrication process of ALP/Fc-Ab2/AuNPs/IL/PSS/Gr by using a Zetasizer Nano S (Malvern Instruments, UK) with the assistance of Beijing ZKBC Testing and Technology CO.,LTD. After modified with PSS solution (5 *wt* %), the Gr surface became negatively charged (column a, Zeta potential = -38.05 mV). Then, with the positive charged IL ([bmim]BF_4) was modified with PSS/Gr (column b, Zeta potential = -24.71 mV), the charge of Zeta potential was increased 13.34 mV. Next, the negatively charged AuNPs decorated the prepared IL/PSS/Gr, the Zeta potential was decreased (column c, Zeta potential = -31.34 mV) compared with column b, indicating the successful attachment of AuNPs on the surface of IL/PSS/Gr. Finally, Fc-Ab2 and ALP were successively assembled on the Au/IL/PSS/Gr, and the product was redispersed in 1 mL of Tris-HCl buffer (pH 8.5) solution, the Zeta potential was further decreased (column d, Zeta potential = -19.00 mV). Based on the above results, we can make the conclusion that the fabrication process of ALP/Fc-Ab2/AuNPs/IL/PSS/Gr is successful.

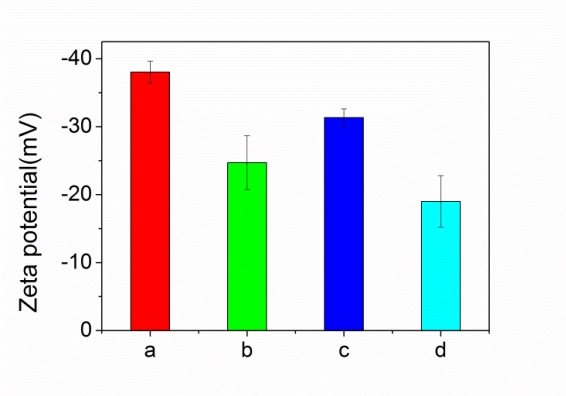

Fig. S1 Zeta-potential analysis of PSS/Gr (a), IL/PSS/Gr (b), Au/IL/PSS/Gr (c) and ALP/Fc-Ab2/AuNPs/IL/PSS/Gr (d).