

**Ultrasensitive Electrochemical Immunosensor for CA 15-3 Using
Thionine-Nanoporous Gold-Graphene as Platform and Horseradish
Peroxidase-Encapsulated Liposome as Signal Amplification**

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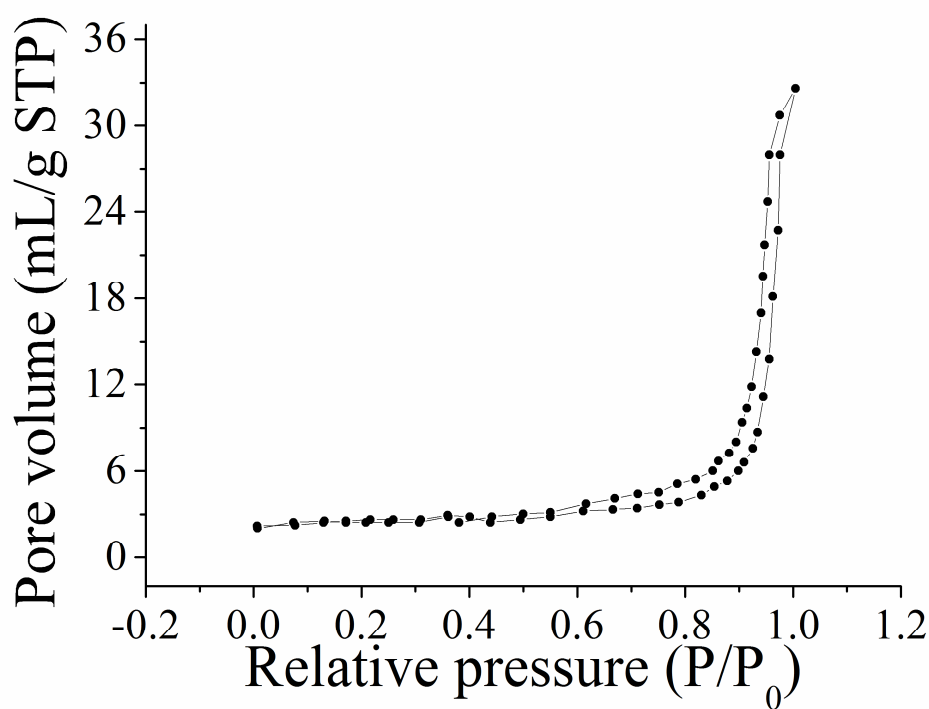


Figure S1 N₂ adsorption–desorption isotherm of NPG

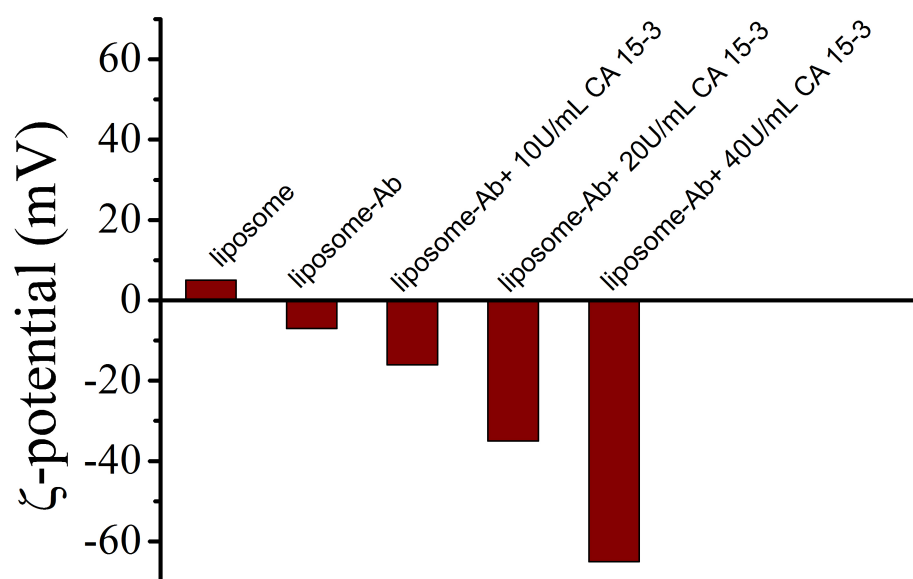


Figure S2 ζ -Potential values of liposomes biofunctionalized. Measurements were obtained before and after modification with anti-CA 15-3 and following incubation with increasing concentrations of CA 15-3.