

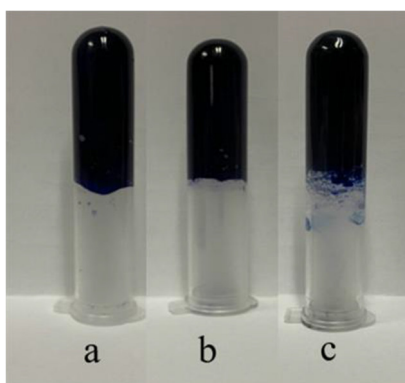
## Electronic Supplementary Information

### Construction of electrochemical immunosensor based on redox hydrogel for ultrasensitive detection of carcinoembryonic antigen

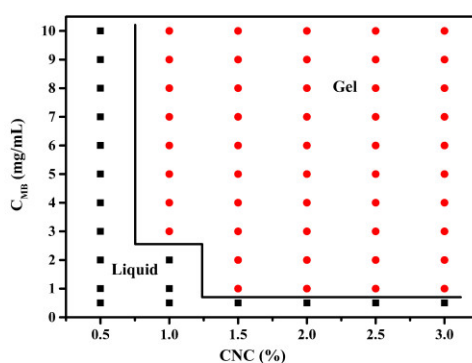
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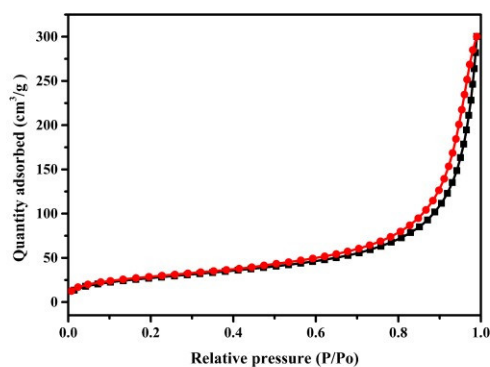
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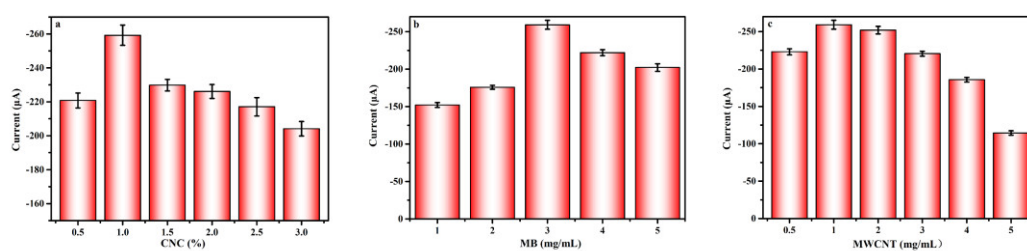
**Fig. S1** Photographs of CNC-MB gel (a), CNC-MB-MWCNT gel (b), and CNC-MB-MWCNT-PDA-rGO-AuNPs gel (c) in centrifuge tubes.



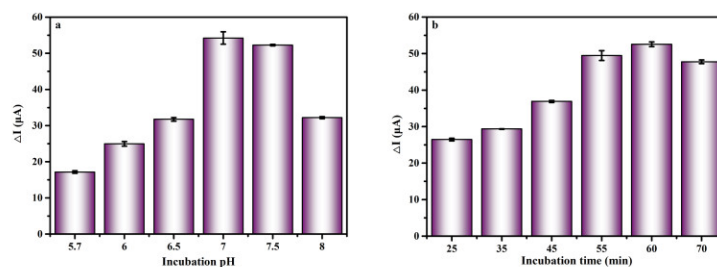
**Fig. S2** State diagram outlining the CNC and MB concentration regimes of the formation of hydrogel.



**Fig. S3** Nitrogen adsorption-desorption isotherm of dehydrated CNC-MB-MWCNT-PDA-rGO-AuNPs gel.



**Fig. S4** Effect of the concentration of CNC (a), MB (b), and MWCNT (c) on the SWV responses for CNC-MB-MWCNT-PDA-rGO-AuNPs gel modified immunosensor.



**Fig. S5** Effects of the incubation pH (a) and incubation time (b) on the SWV responses of the immunosensor for  $50 \text{ ng} \cdot \text{mL}^{-1}$  CEA.