

Electronic Supplementary Information

Development of sensitive and selective glucose colorimetric assay using glucose oxidase immobilized on magnetite-gold-folate nanoparticles

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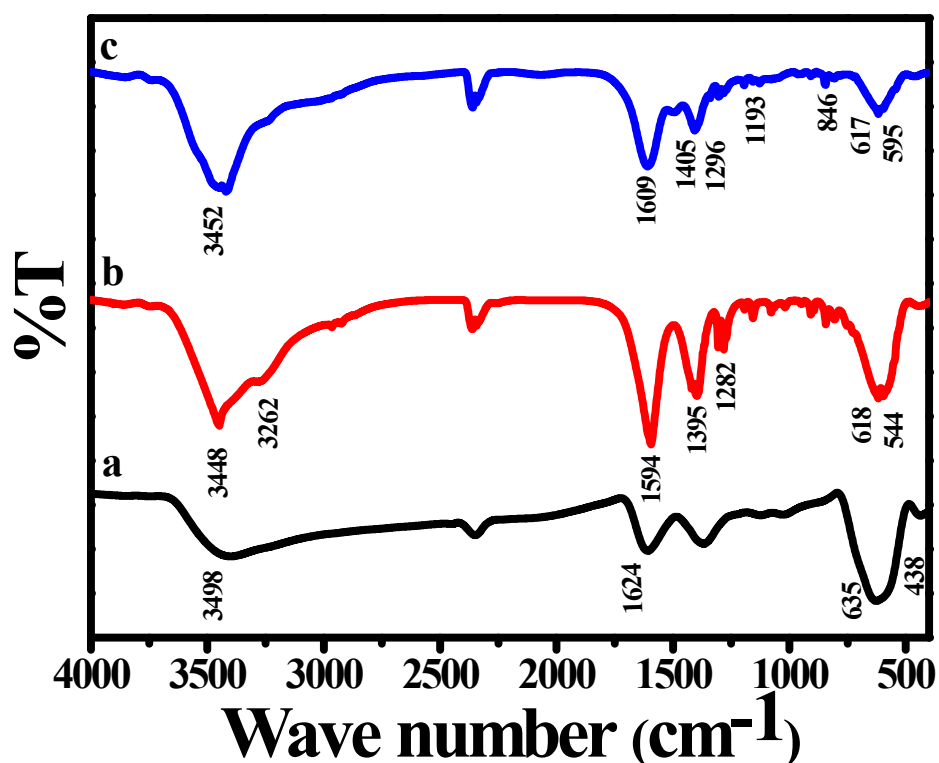


Fig.S1. FT-IR spectra of (a) Fe₃O₄, (b) Fe₃O₄@Au, and (c) Fe₃O₄@Au-Cys-FA

Fig. 1S shows the FT-IR spectra of uncoated Fe₃O₄, Fe₃O₄@Au and Fe₃O₄@Au-Cys-FA. For Fe₃O₄ (Fig. 1S (a)), the bands at 3498 cm⁻¹ and 1624 cm⁻¹ are assigned to stretching and bending vibrations of OH group, respectively which due to adsorbed water on the surface of the Fe₃O₄ nanoparticles. The spectra also show the bands at 635 cm⁻¹ and 438 cm⁻¹ correspond to the Fe-O bond vibration of Fe₃O₄ nanoparticles. For Fe₃O₄@Au spectrum (Fig. 1S (b)), the observed band around 3262 cm⁻¹ and 1594 cm⁻¹ are assigned to CH₂ stretching and 1395 cm⁻¹ and 1282 cm⁻¹ assigned to C=O asymmetric stretching vibration from carboxylate (COO⁻) of citrate which indicated the successful of Au coated Fe₃O₄ nanoparticles. Another evident for Au coated Fe₃O₄ was observed from the shift of Fe-O stretching band of uncoated Fe₃O₄ at 635 cm⁻¹ to 618 cm⁻¹ and the decreasing of intensity due to Au coating. The band at 3452 cm⁻¹ of Fe₃O₄@Au-Cys-FA (Fig. 1S (c)) is assigned to the N-H stretching vibration in -NH₂ and the bands around 1405 cm⁻¹ and 1609 cm⁻¹ are attributed to C-C aromatic ring stretching vibration of folic acid. These results indicate the successful coating of Cys and FA on Fe₃O₄@Au core. Our confirmation data of Fe₃O₄@Au-Cys-FA formation is consistent with previous report from Sh. Karamipour *et al*¹⁹.

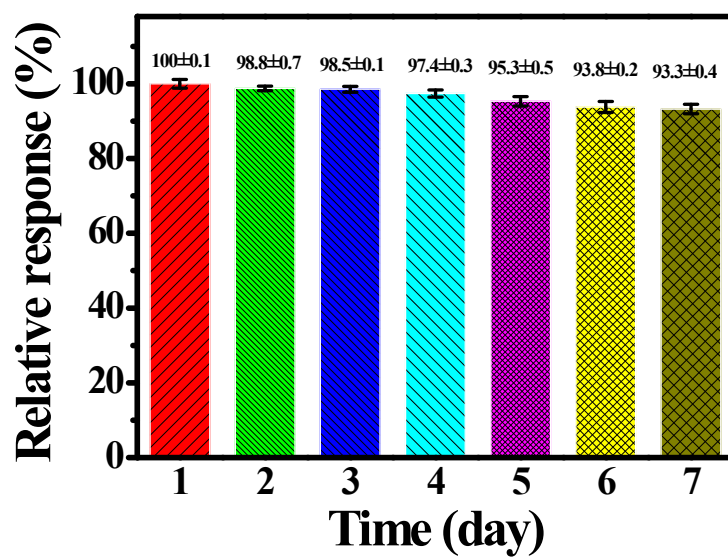


Fig.S2. Stability of the developed glucose detection using $\text{Fe}_3\text{O}_4@$ Au-Cys-FA-GOx nanocomposites.

Table S1 The hydrodynamic size and zeta potentials of nanocomposites dispersed in water at various immobilization stages.

Nanocomposites at various immobilization stages	DLS	
	Particle size (nm)	Zeta potential (mV)
<i>Fe₃O₄</i>	182.0	-20.3
<i>Fe₃O₄@Au</i>	203.8	-24.3
<i>Fe₃O₄@Au-Cys-FA</i>	250.0	-28.1