Supplementary Information (SI) for New Journal of Chemistry.

Gold Nanoparticle-Mediated Fluorescence Quenching of NCQDs for Turn-On Detection of Glutathione

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UV – Visible measurements

The stability of AuNPs was assessed by monitoring their UV–Vis absorption spectra during storage for up to 7 days. As shown in Figure X, the surface plasmon resonance peak at ~520 nm remained unchanged in both position and intensity, suggesting no aggregation or degradation of AuNPs under storage conditions. These results confirm the excellent stability of AuNPs, ensuring their reliability for use in the NCQDs–AuNPs sensing system.

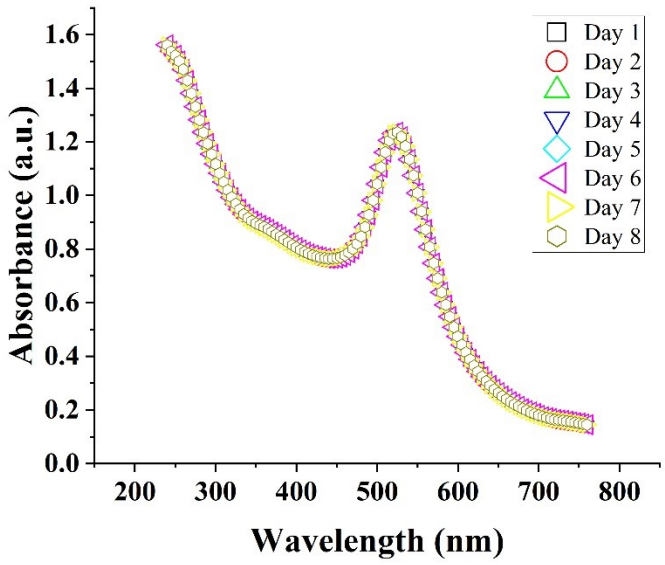

Figure SI 1. UV–Vis absorption spectra of AuNPs recorded over a storage period of 0–7 days.

DLS Measurement's

Figure SI 2.

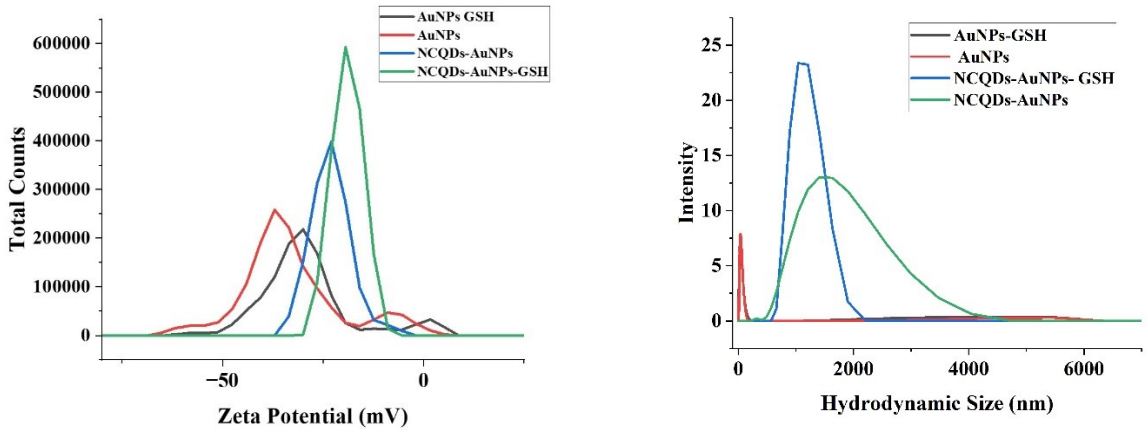

Figure SI 2. Zeta Potential and Hydrodynamic size of AuNPs-GSH, AuNPs, NCQDs-AuNPs and NCQDs-AuNPs-GSH system

S.N.	Material	Size (nm)	Zeta Potential (mV)
1.	AuNPs	16.68	-30.13
2.	AuNPs + GSH	18.79	-29.31
3.	NCQDs + AuNPs	1114	-16.01
4.	NCQDs + AuNPs + GSH	1343	-22.76

The fluorescence spectra of NCQDs were recorded at pH 5.0–9.0 (Figure SI 3). Maximum intensity and stability were observed near neutral to slightly alkaline conditions (7.0–8.0), while both acidic (5.0–6.0) and alkaline (9.0) media caused significant quenching due to surface protonation/deprotonation effects. These results justify the use of Tris buffer at **pH 7.5** as the optimal condition for subsequent sensing experiments

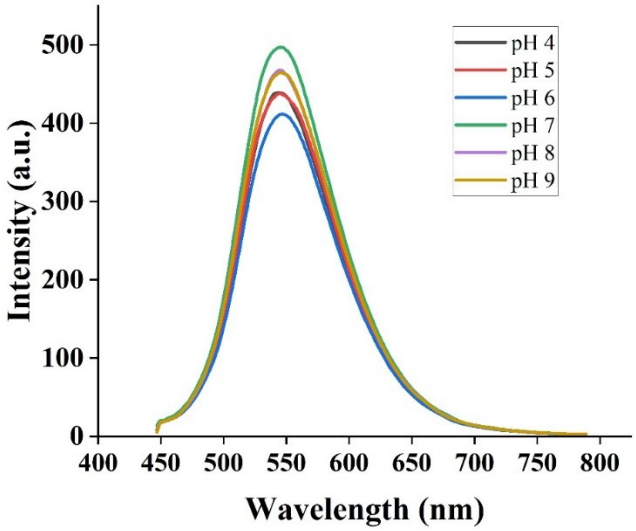

Figure SI 3. FL Intensity of NCQDs at Different pH Variation