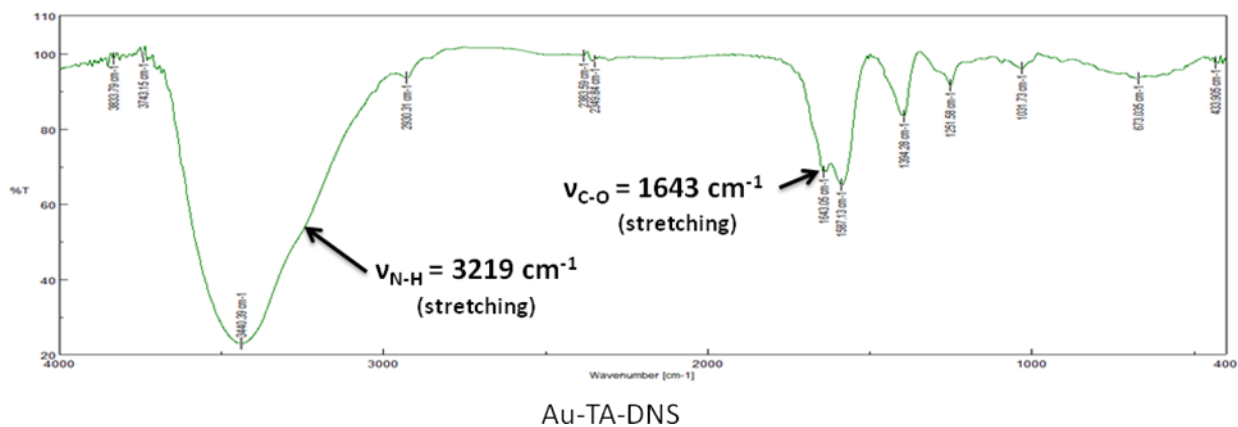


Supporting figures/tables

Figure S1

(a)



(b)

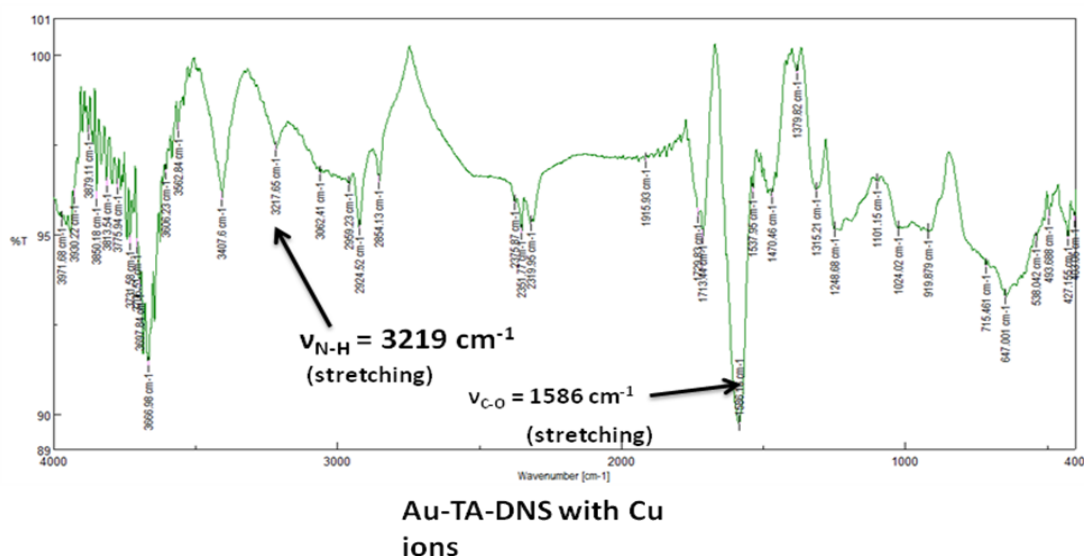


Fig. S1 (a) FTIR spectrum of the complete gold nanosensor, Au-TA-DNS; peaks at $\nu_{\text{NH}} = 3219 \text{ cm}^{-1}$, $\nu_{\text{CO}} = 1643 \text{ cm}^{-1}$ corresponds to the stretching vibration of –NH and –C=O respectively. (b) FTIR spectrum of metal bound Au-TA-DNS, peaks at ν_{NH} at 3219 cm^{-1} and the red shift of the carbonyl ν_{CO} to 1586 cm^{-1} indicate that the carbonyl O-atom and hydrazine N-atom are the coordination sites.

Figure_S2

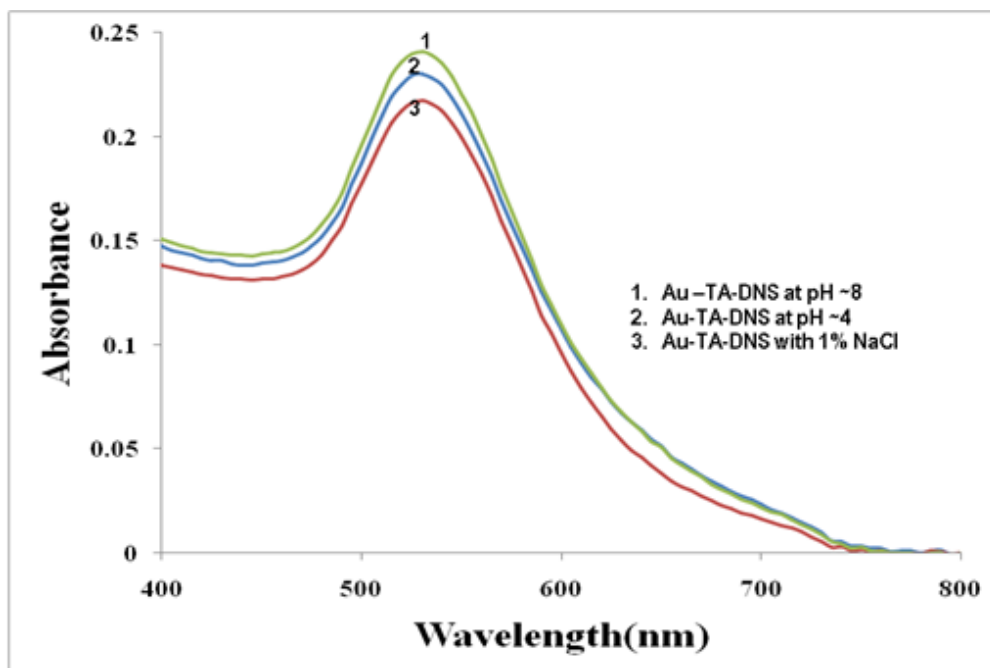


Fig S2: UV-vis spectra of gold nanosensor Au-TA-DNS at pH~8, pH~4 and 1% NaCl showing stability at various conditions.

Figure_S3

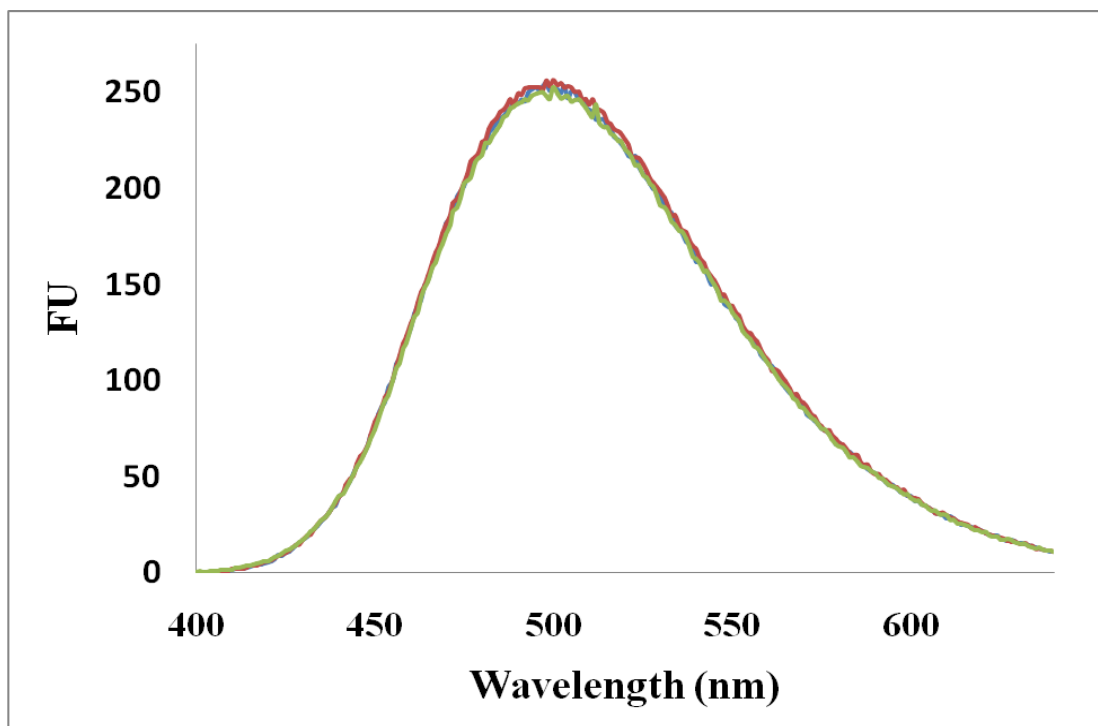


Fig S3 Fluorescence spectrum of dansylhydrazine in presence of lead and copper ions. Dansylhydrazine alone did not show any change in fluorescence intensity when metal ions are added.

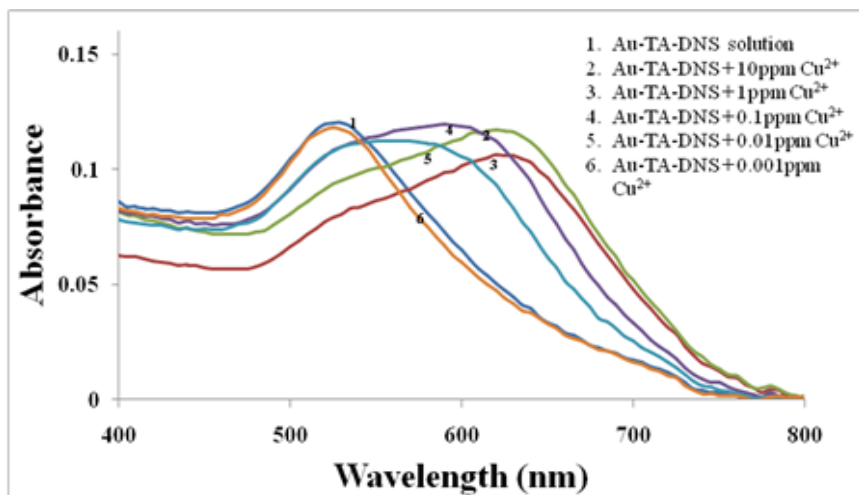


Figure S4: UV-Vis spectra showing Au-TA-DNS with various concentrations of Cu²⁺ ions.

Figure_S5

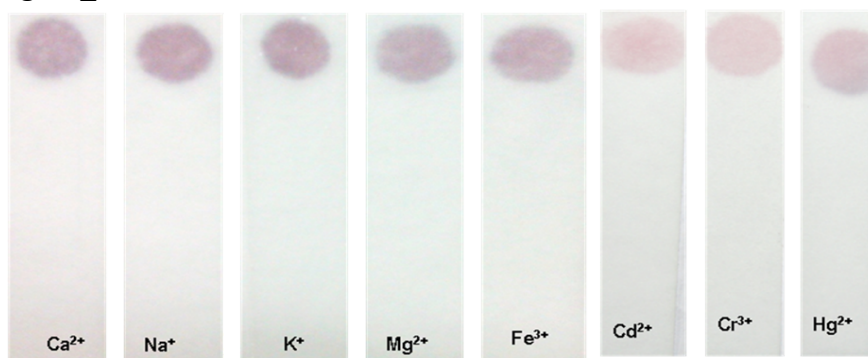


Figure S5: Image showing straight paper strips assay with Au-TA-DNS and 10ppm of various metal ions. No bluish black color formation was observed with these metal ions indicating the specific selectivity towards Pb(II) and Cu(II).

Table S1

CONSTRUCT	Citrate-AuNP	Au-TA	Au-TA-DNS	Au-TA-DNS with Lead(II) ion	Au-TA-DNS with Copper (II) ion
SIZE (nm)	44±0.7	56±3.5	71±1.2	128±4.4	114±3.5
CHARGE (mV)	-24.4	-31.3	-38.2	-37.0	-28.4

Table S1: Hydrodynamic size and surface charge measurements at different chemical modification steps and after addition of metal ions Pb²⁺ and Cu²⁺ .