Supplementary File

Concanavalin A-conjugated gold nanoparticles/silica quantum dotes (AuNPs/SiQDs-Con A)-based platform as a fluorescent nanoprobe for bioimaging of glycan-positive cancer cells

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Figures and Table

Calculation of the synthesis yields

cit-AuNP/MPA

The synthesis yield of the gold based nanoparticles could be calculated using a calibration curve of AuNPs at around 550 nm. By applying the calibration curve equation, the final synthesis yield of the cit-AuNP/MPA was calculated as 63.1%.

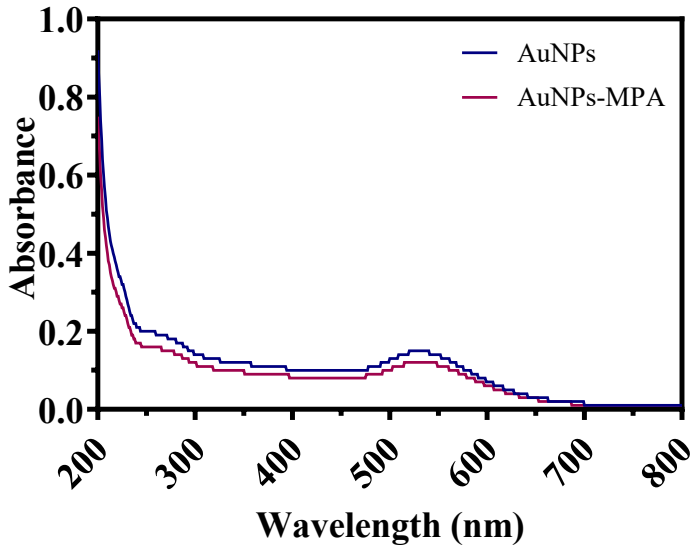


Fig. S1. UV spectra of AuNPs and AuNPs-MPA

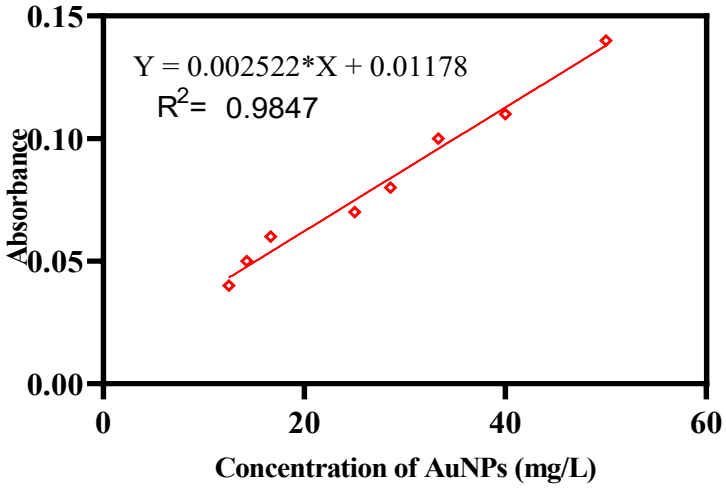


Fig. S2. Calibration curve of AuNPs at various concentrations.

Si-NH$_2$ QDs

APTES as precursor of SiNH2 QDs has an absorption peak around 300 nm. We utilized this wavelength as the reference wavelength for synthesis yield calculation. Before any calculation a calibration curve was constructed for different concentration of APTES at 300 nm. The calculated the synthesis yields of Si-NH2 QDs was calculated to be 56.3%.

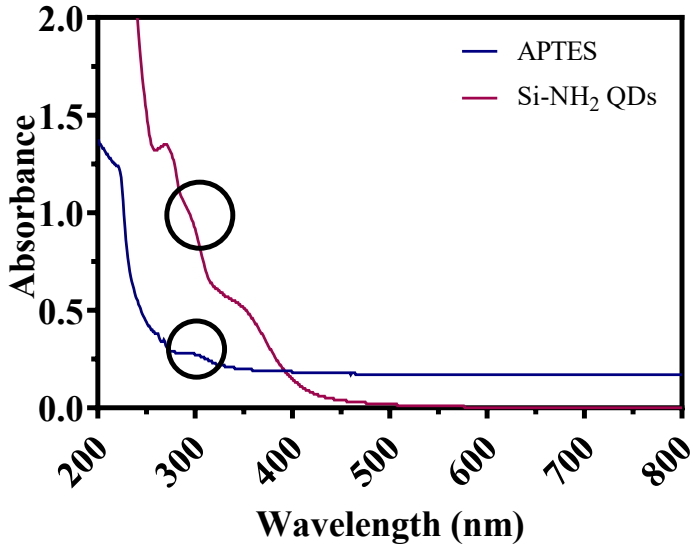


Fig. S3. UV spectra of APTES and Si-NH$_2$ QDs.

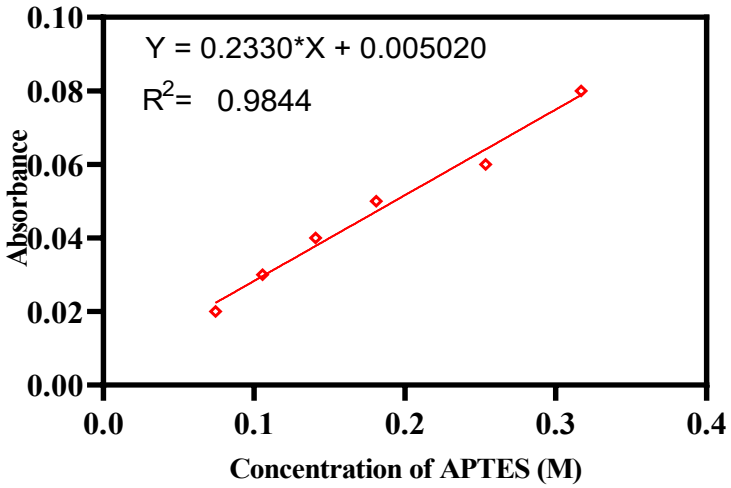


Fig. S4. Calibration curve of APTES at various concentrations.

cit-AuNPs-MPA/Si-NH$_2$ QDs and cit-AuNPs-MPA/Si-NH$_2$ QDs/Con A

Fluoresce technique was used to determine synthesis yields of cit-AuNPs-MPA/Si-NH$_2$ QDs and cit-AuNPs-MPA/Si-NH2 QDs/Con A. To do two calibration curves were plotted for Si-NH2 QDs

and cit-AuNPs-MPA/Si-NH_2 QDs at various concentrations for the determination of synthesis yield of cit-AuNPs-MPA/Si-NH_2 QDs and cit-AuNPs-MPA/Si-NH2 QDs/Con A, respectively. The obtained synthesis yields of cit-AuNPs-MPA/Si-NH_2 QDs and cit-AuNPs-MPA/Si-NH2 QDs/Con A were 72.0%, 78.2%, respectively.

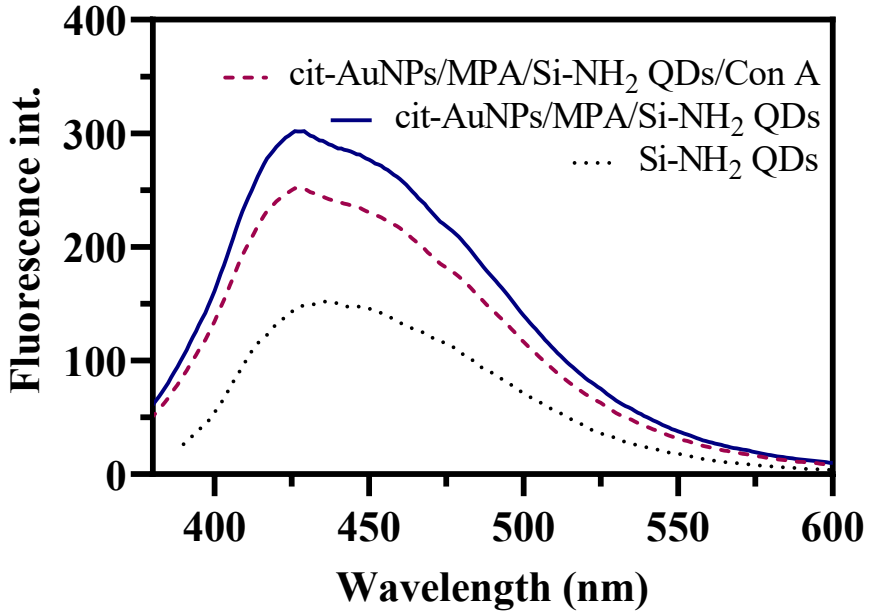


Fig. S5. Typical fluorescence spectra of Si-NH_2 QDs, cit-AuNPs-MPA/Si-NH_2 QDs and cit-AuNPs-MPA/Si-NH_2 QDs/Con A:

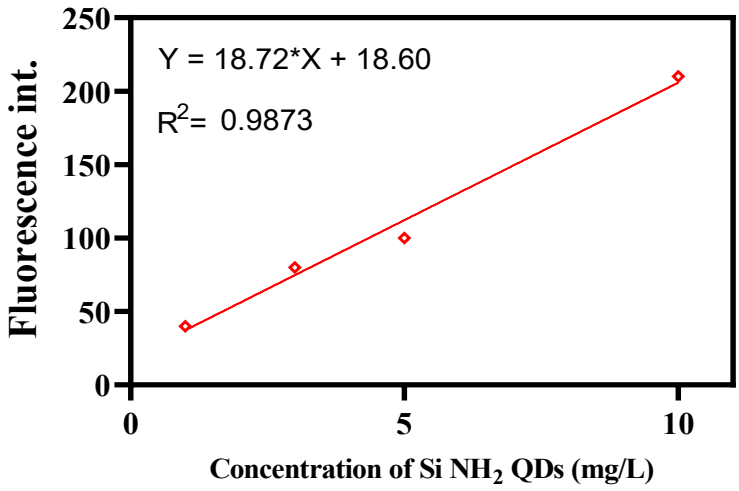


Fig. S6. Calibration curve of cit-AuNPs-MPA/Si-NH_2 QDs at various concentrations.

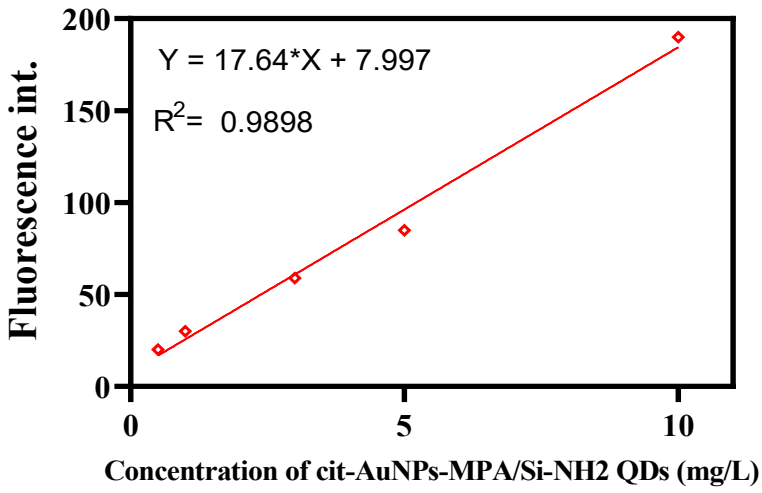


Fig. S7. Calibration curve of Si-NH_2 QDs at various concentrations.

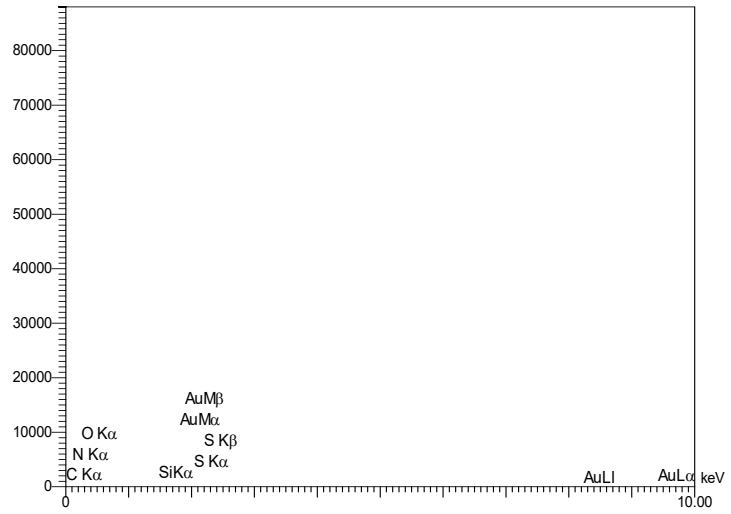


Fig. S8. EDX elemental composition of the cit-AuNPs/MPA/Si-NH_2 QDs/Con A.

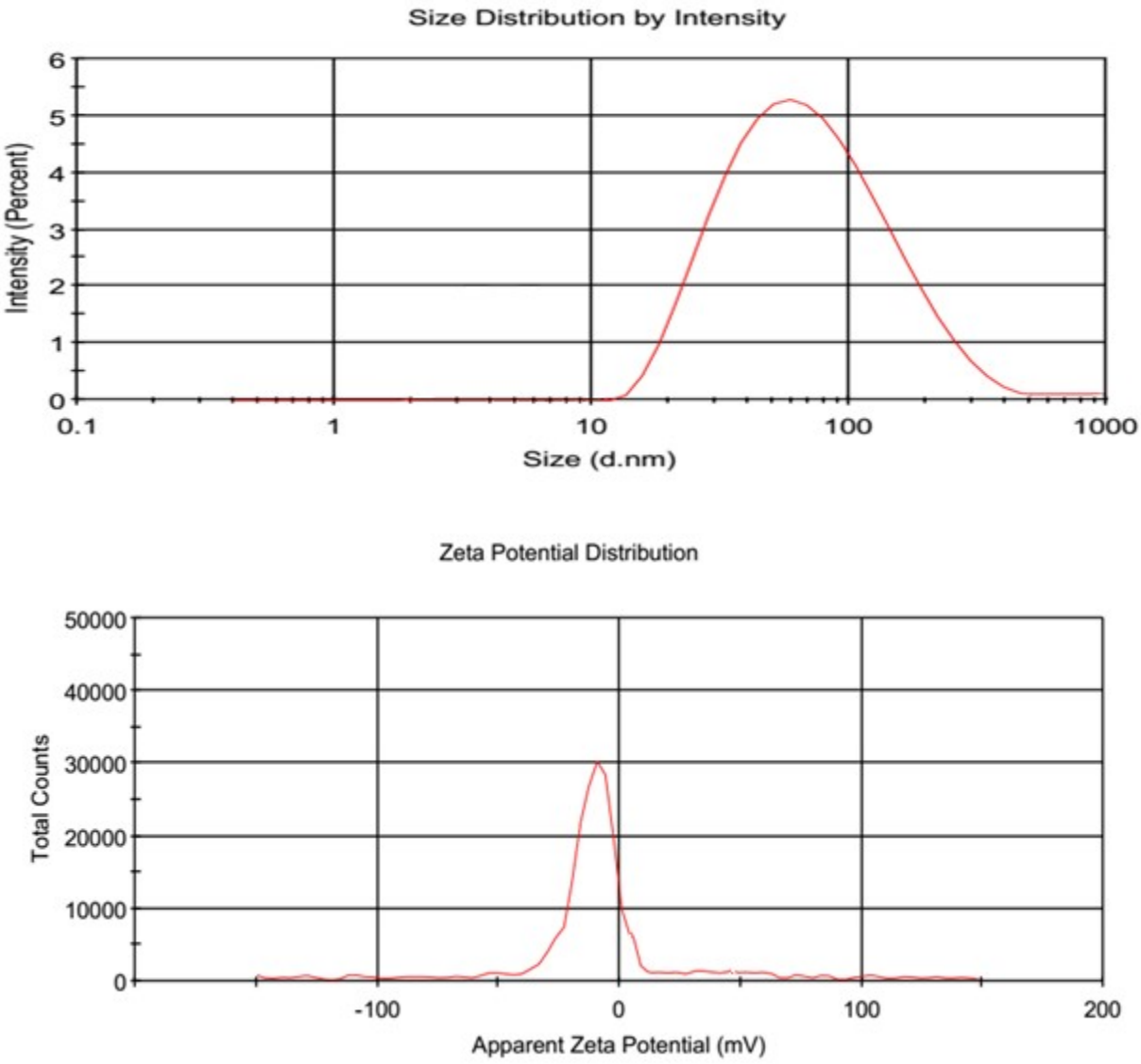


Fig. S9. DLS (a) and zeta potential (b) profiles of cit-AuNPs/MPA/Si-NH_2 QDs/Con A.

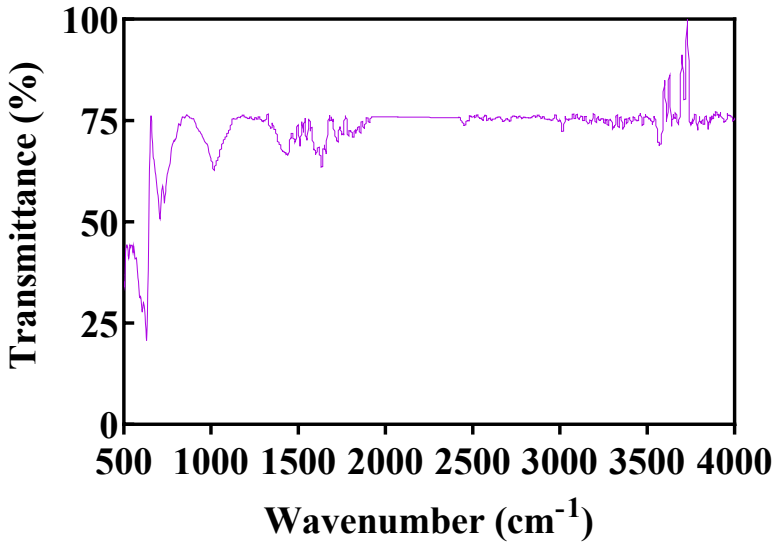


Fig. S10. FTIR spectra of cit-AuNPs/MPA/Si-NH_2 QDs/Con A.

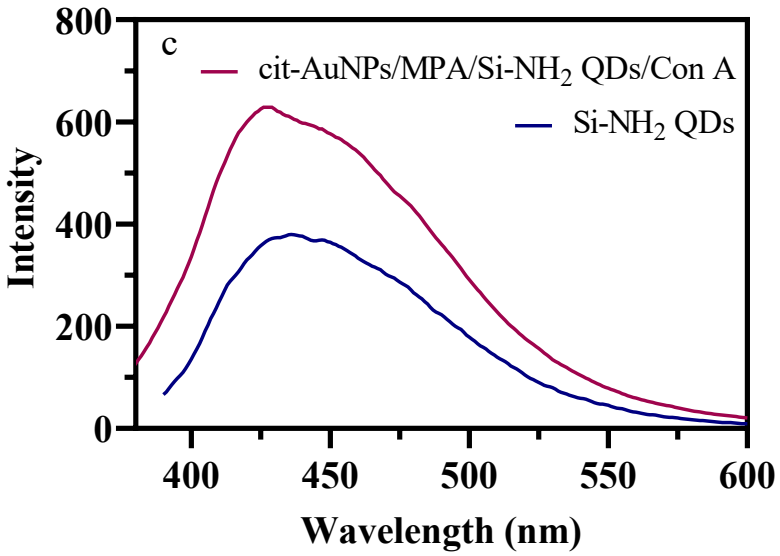


Fig. S11. Emission spectra of the Si-NH_2 QDs and cit-AuNPs/MPA/Si-NH_2 QDs/Con A.

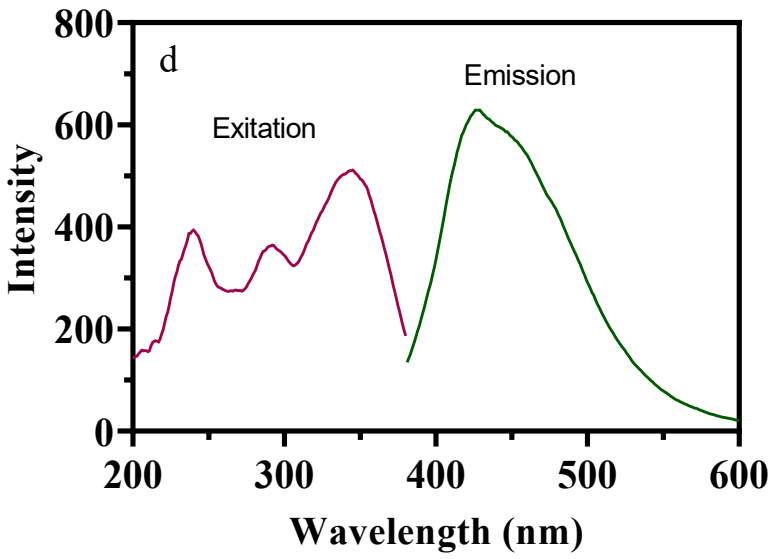


Fig. S12. Excitation and emission spectra of the cit-AuNPs/MPA/Si-NH_2 QDs/Con A.

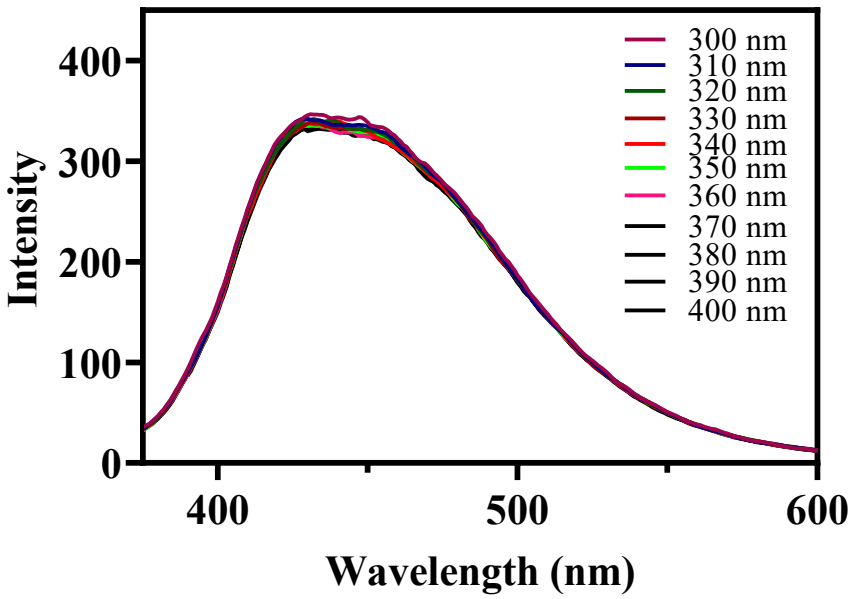
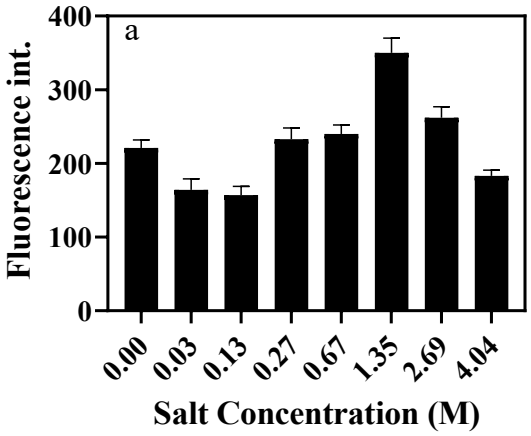
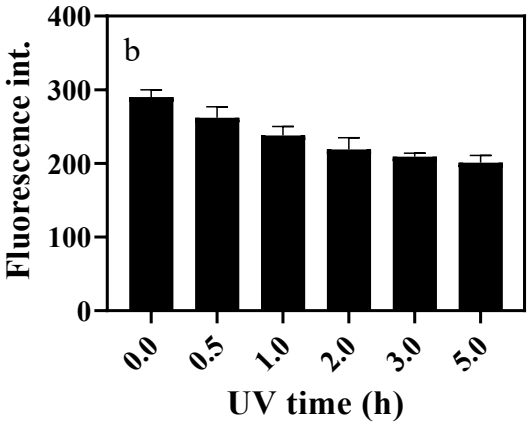
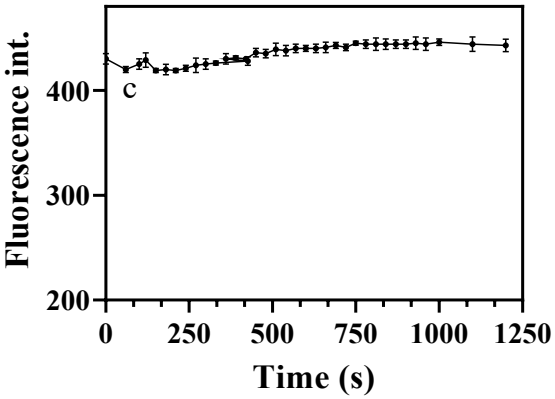


Fig. S13. Effect of various excitations wavelengths on the fluorescence emission of cit-AuNPs/MPA/Si-NH_2 QDs/Con A NPs.


a
Fluorescence int.
400
300
200
100
0
0.00
0.03
0.13
0.27
0.67
1.35
2.69
4.04
Salt Concentration (M)


b
Fluorescence int.
400
300
200
100
0
0.0
0.5
1.0
2.0
3.0
5.0
UV time (h)


c
Fluorescence int.
400
300
200
0
250
500
750
1000
1250
Time (s)

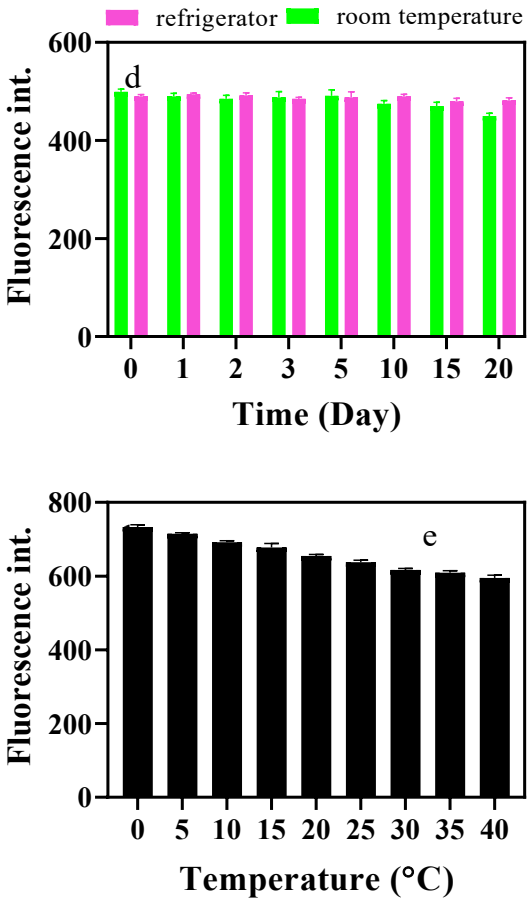


Fig. S14. Effects of salt effect (a), UV exposure (b), time (c), storing time (d) and, temperature (e) on the fluorescence of cit-AuNPs/MPA/Si-NH_2 QDs/Con A.

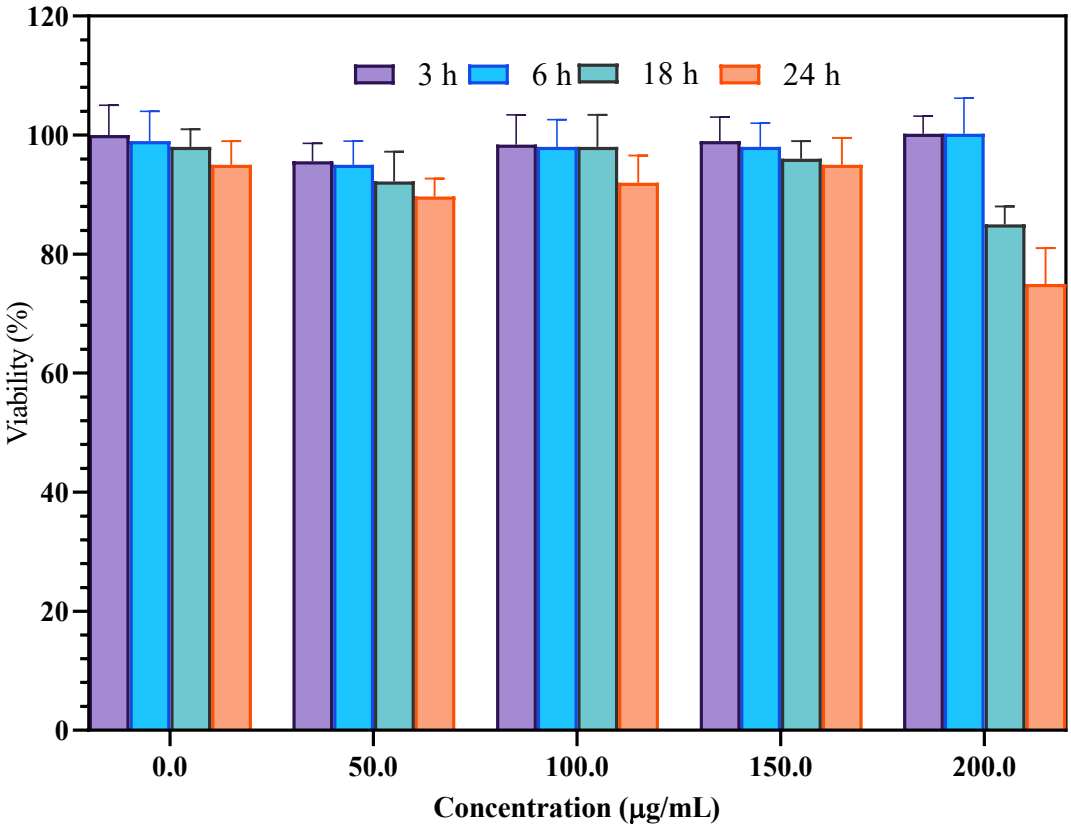


Fig. S15. *In vitro* cytotoxicity evaluation of cit-AuNPs/MPA/Si-NH_2 QDs/Con A on MCF 7 cancer cells for 3, 6, 18, and 24 h in various concentrations of 0.0, 50, 100, 150, and 200 mg/L.

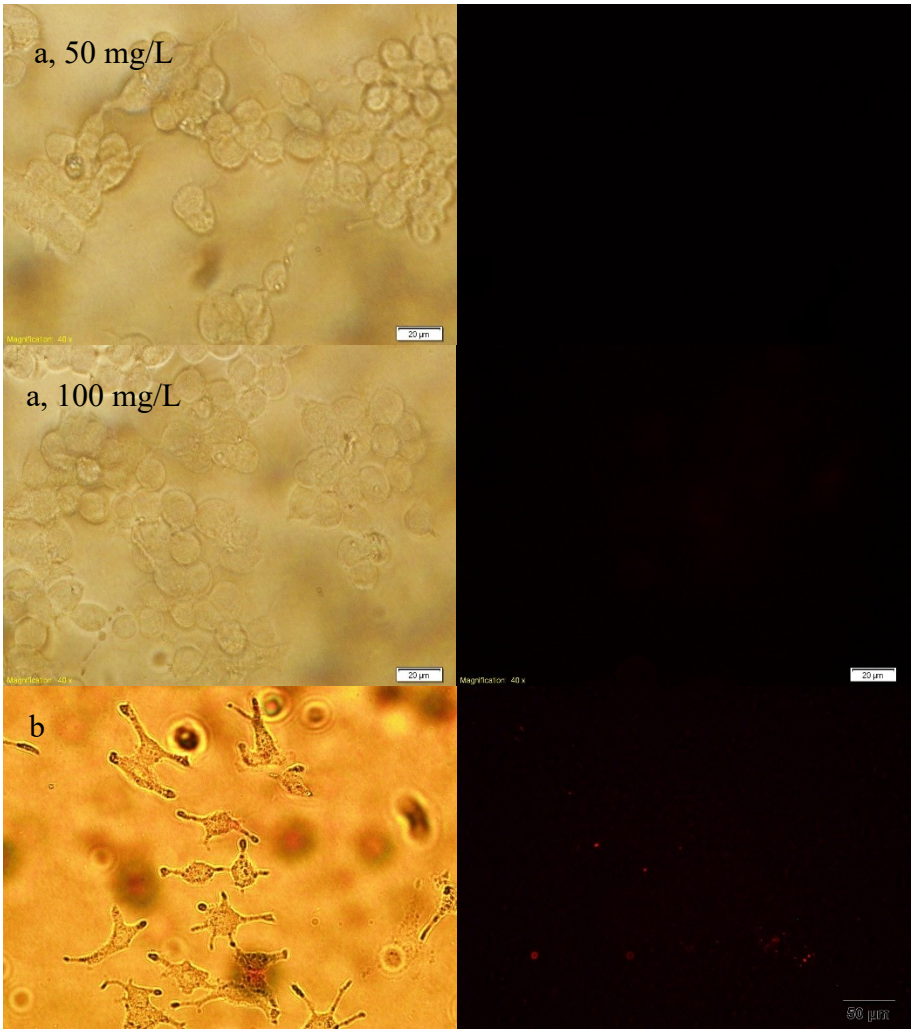


Fig. S16. (a) Incubation of HEK 293 normal cell with cit-AuNPs/MPA/Si-NH_2 QDs/Con A (50 mg/L and 100 mg/L for 3 h) and (b) incubation of MCF 7 cancer cells with cit-AuNPs/MPA/Si-NH_2 QDs (100 mg/L for 3 h).

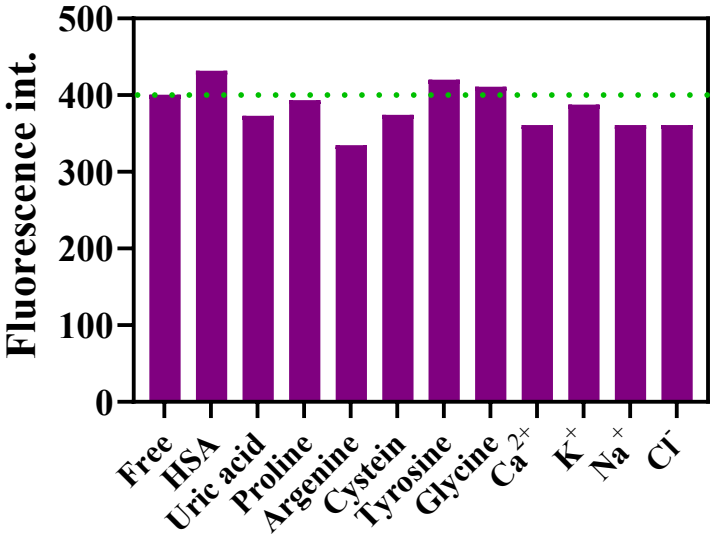


Fig. S17. Effects of some interfering agents *i.e.* HSA, uric acid, prion, arginine, cysteine, glycine, Ca^{2+}, K^{+}, Na^{+}, and Cl^{-} on the fluorescence emission of cit-AuNPs/MPA/Si-NH_2 QDs/Con A.

Table S1. EDS analysis data for cit-AuNPs/MPA/Si-NH_2 QDs/Con A with weight and atomic percentages.

Element	W%	A%
C	28.96	44.93
N	11.53	15.34
O	21.53	25.08
Si	15.31	10.16
S	4.80	2.79
Au	17.87	1.69
Total	100.00	100.00