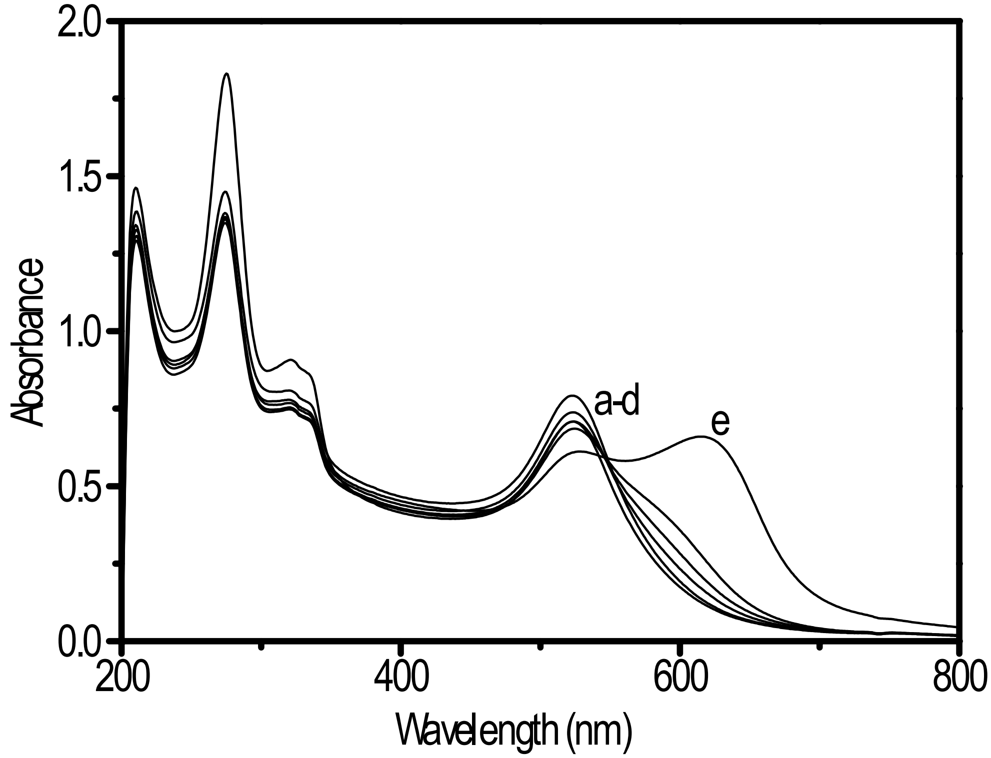
Supporting information 1



The time dependent UV-Visible spectra obtained after mixing (0.25mM) cfH with gold nanoparticles at a time interval of 30 minutes (traces a-d); trace (e) was taken after 6 hours. Trace (a) corresponds to time zero, ie. just after addition of cfH.

Supporting information 2

Calculation of the surface coverage of the nanoparticles from the absorption spectroscopy.

(i) The calculations for the number of cfH molecules per Au particle are as follows:

The intensity of dominant peak at 271 nm of pure cfH in water was taken as the reference for measuring the molar concentration.

I_0, the initial intensity just after mixing and I_c is the intensity of the centrifugate.

$I_0 - I_c = I_a$ (the intensity corresponding to cfH molecules adsorbed on Au nanoparticle surface ---------(1)

Intensity $(I_a) \alpha$ concentration (C_a)

We measured the intensity of known concentration of pure cfH (C_k), which is (I_k).

$(I_a) = K (C_a)$ -------(2)

$(I_k) = K (C_k)$ -------(3)

From equations (2) and (3), (C_a) can be calculated.

398 g of $HAuCl_4.3H_2O$ on reduction will give 198 g of Au.

W is the weight of Au formed theoretically. From TEM measurements, we can calculate the radius/volume of the nanoparticle. From that, we calculate, the weight of each nanoparticles (W_{np}). From this, the number of nanoparticles is,

$N_p = W / W_{np}$ -------(4)

Number of cfH molecules $(N_m) = C_a \times 6.023 \times 10^{23}$ -------------(5)

Number of cfH molecules per nanoparticle (x) = N_m / N_p -------------(6)

A standard solution of ciprofloxacin in water is taken for this calculation (0.1 mM), which is (C_k)

It shows an absorbance intensity of 1.6175 (I_k))

Thus $I_k = 1.6175$, C_k = 0.1 mM -----------------(7)

The concentration of $HAuCl_4. 3H_2O$ =0.05 mM, so that, 1000 ml of the sol contains 9.9×10^{-3}g of Au ,

The weights (W_{np}) of 4 nm and 15 nm nanoparticles are 0.647×10^{-18}g and 34.1×10^{-18}g respectively.

Thus the number of 4 nm and 15 nm nanoparticle (N_p) present in 1000 ml of gold colloids are 1.53×10^{16} and 2.9×10^{14} respectively.

Case 1 : 4 nm particles

I_o =1.758, I_c =1.306, Hence, N_m = 9.94 X 10^{18} ---------------- (8)

From the above, number of cfH molecule per nanoparticle (x) = $N_m / N_p \approx 65$

Case 2 : 15 nm particles

I_o =1. 353, I_c =1.294, Hence, N_m = 1.7 X 10^{17} -------------------(9)

Hence, the number of cfH molecules per nanoparticle (x) = $N_m / N_p \approx 585$

(ii) Calculation of surface area or density of cfH molecules

Surface area of cfH molecules = surface area of a nanoparticle / number of cfH molecules per nanoparticle

Case 1: 4 nm particles

Surface area (A) = 200.96 nm^2

Number of cfH molecule per nanoparticle (x) = $N_m / N_p \approx 65$

Area of cfH = A / x =200.96 / 65 = 3.09 nm^2

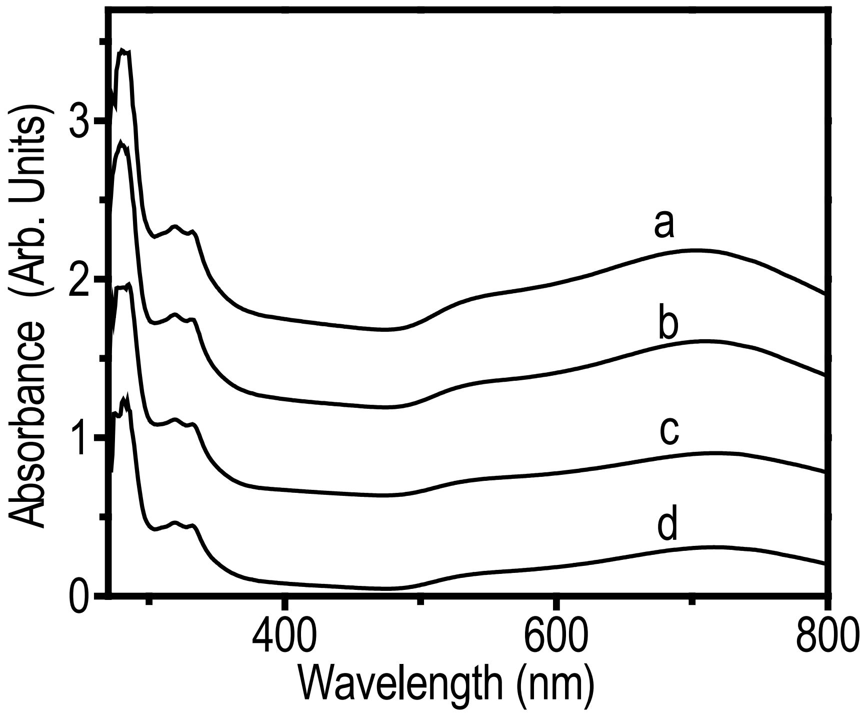
Case 2: 15 nm particles

Surface area nanoparticle (A) = 2826 nm^2

Number of cfH molecule per nanoparticle (x) = $N_m / N_p \approx 585$

Surface area of cfH molecules = A / x =2826 / 585 = 4.84 nm^2

Supporting information 3



UV-visible spectra of cfH (0.25 nm) capped gold nanoparticles (15-20 nm) dispersed in different organic solvents. a) dimethyl sulphoxide, b) N,N dimethyl formamide, c) 1- butanol and d) 2-propanol. The spectra have been shifted vertically.