

Probing the Role of Cu(II) ion on Protein Aggregation Using Two Model Proteins

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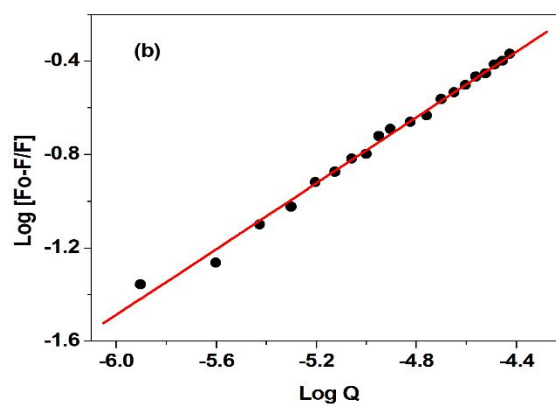
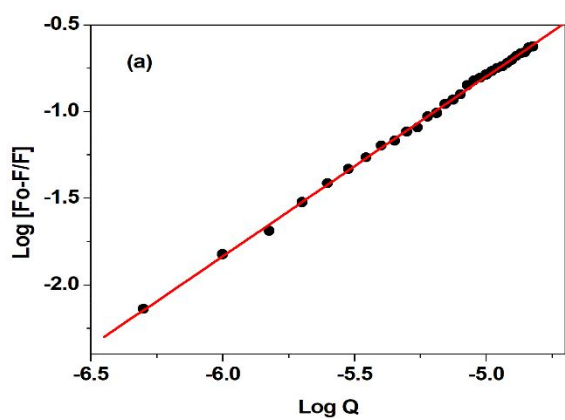
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Supporting Information



Cu(II)ions	τ_1 (ns)	τ_2 (ns)	α_1	α_2	τ_m (ns)	χ^2
0	3.51	6.94	22.14	77.86	6.18	1.09
1	3.45	6.88	21.79	78.21	6.13	1.12
1.50	3.29	6.82	20.44	79.56	6.10	1.11
2	3.39	6.86	22.02	77.98	6.09	1.09

Figure S1.	2.50	3.45	6.86	22.04	77.96	6.11	1.12	Plot of
Log[F ₀ - F/F]	5	3.44	6.86	22.90	77.10	6.08	1.11	versus LogQ
for (a) BSA	7	3.36	6.94	21.32	78.68	6.18	1.12	and (b) HSA
at pH 7.4 and	15	3.40	6.79	23.74	76.26	5.98	1.13	298 K.

Table S1. Fluorescence life time parameters of BSA in presence of Cu(II) ion.

Cu(II)ions	τ_1 (ns)	τ_2 (ns)	τ_3 (ns)	α_1	α_2	α_3	τ_m (ns)	χ^2
0	9.99	3.33	7.33	9.13	44.28	46.59	5.80	1.12
2.50	1.23	3.85	7.65	13.92	47.21	38.87	4.96	1.13
3.75	3.42	1.09	7.33	43.37	10.86	45.77	4.96	1.17
5	9.21	3.29	7.27	8.87	44.67	46.46	5.67	1.15
7.50	3.51	1.14	7.41	44.58	11.66	43.76	4.94	1.15
10	3.59	1.10	7.56	47.38	11.41	41.21	4.95	1.14
11.25	1.16	3.70	7.57	12.61	46.98	40.41	4.94	1.16
12.50	1.14	3.61	7.48	12.19	45.88	41.94	4.93	1.21
17.50	1.13	3.53	7.38	11.88	44.83	43.29	4.91	1.15
20	3.36	1.00	7.28	44.14	10.19	45.67	4.91	1.14
25	3.64	1.18	7.49	45.50	12.89	41.61	4.92	1.15
27.50	1.21	3.81	7.65	13.72	48.29	37.99	4.91	1.14
32.50	1.04	3.46	7.36	11.02	45.45	43.54	4.89	1.14
37.50	1.06	3.51	7.42	10.98	46.95	42.07	4.89	1.13

Table S2. Fluorescence life time parameters of HSA in presence of Cu(II) ion

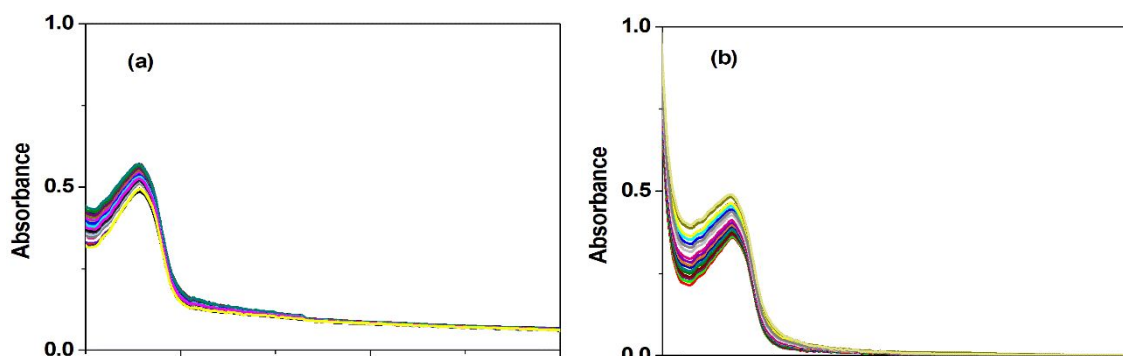


Figure S2. UV-Vis spectra of (a) BSA and (b) HSA in presence of increasing concentrations of Cu(II) ion at pH 7.4 and 298 K.

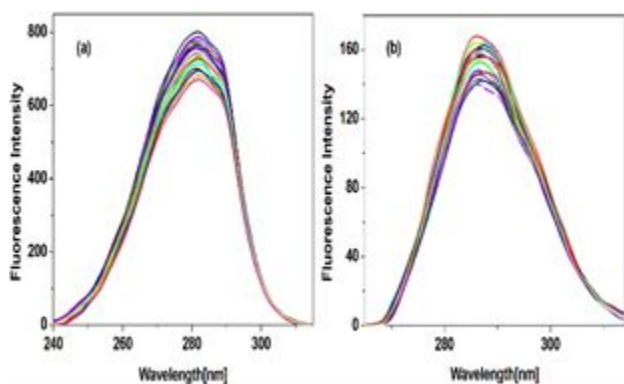


Figure S3. Synchronous fluorescence spectra of BSA in the presence of increasing concentrations of Cu(II): [BSA] = 10 μ M; [Cu(II)] = 0–15 μ M at 298 K; pH 7.4. (a) $\Delta\lambda = 60$ nm; (b) $\Delta\lambda = 15$ nm.

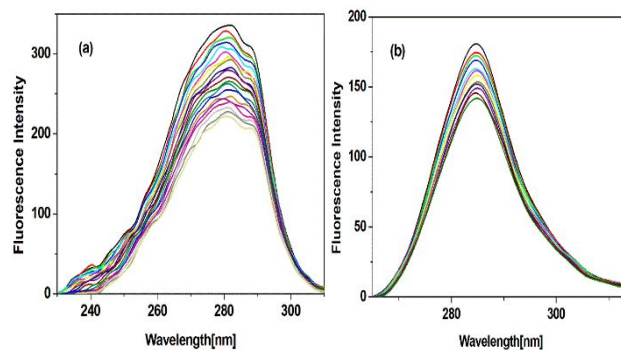


Figure S4. Synchronous fluorescence spectra of HSA in the presence of increasing concentrations of Cu(II): [HSA] = 10 μ M; [Cu(II)] = 0–37.50 μ M at 298 K; pH 7.4. (a) $\Delta\lambda$ = 60 nm; (b) $\Delta\lambda$ = 15 nm.

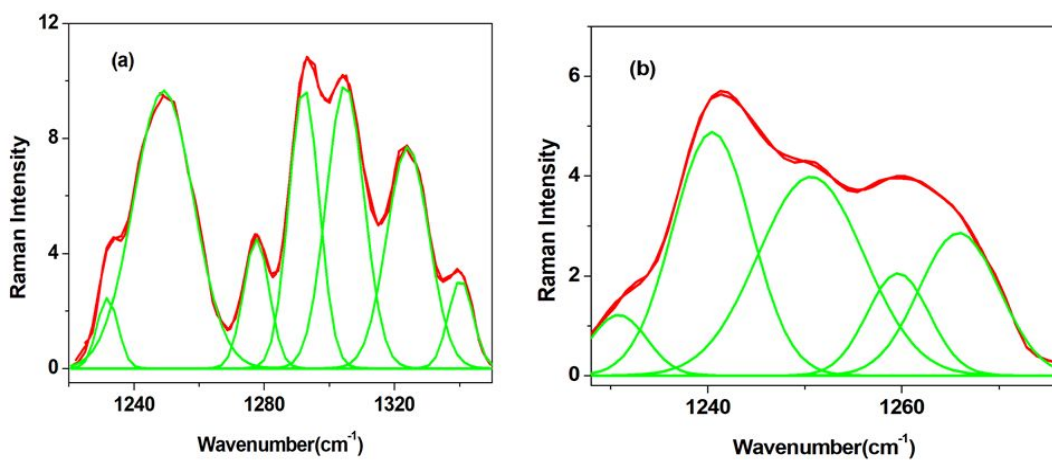


Figure S5. (a) Deconvolution of Amide III region of BSA alone and (b) with the addition of 15 μ M Cu(II) ion displaying an increment in antiparallel β -sheet and Random clew conformations.

	BSA 7.4	+ 5 μ M Cu(II)	+7 μ M Cu(II)	+15 μ M Cu(II)
β sheet	8.57	15.49	17.18	20.57
α helix	10.67	10.14	----	----
Random clew	24.96	16.08	16.96	27.76

Table S3. Percentage analysis of different secondary structural elements obtained after deconvolution of Amide III (1200–1300 cm^{-1}) band of BSA and with the addition of varying concentrations of Cu(II) ion, pH 7.4

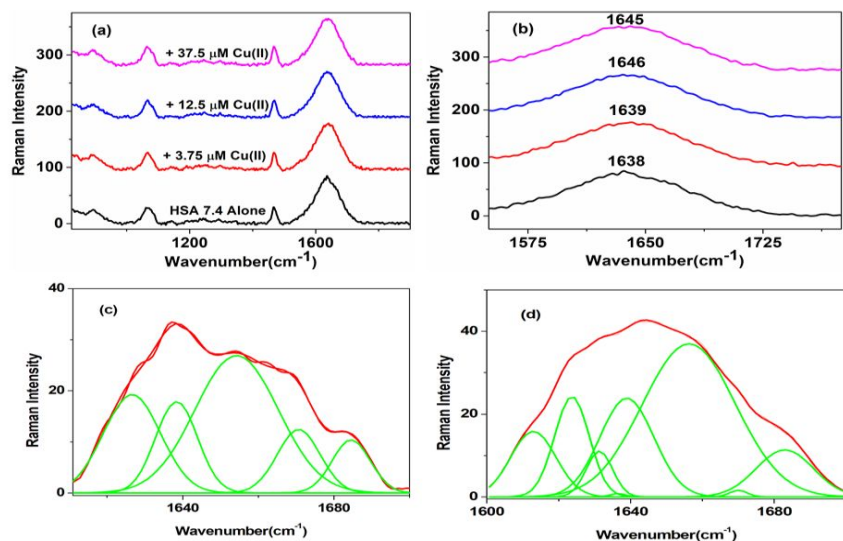


Figure S6. Raman spectra of HSA and HSA–Cu(II) complex at physiological pH. (a) Raman spectra of HSA alone and in the presence of different concentrations of Cu(II) (800–1800 cm^{-1}). (b) Amide I (1600 -1700 cm^{-1}) region. (c and d) Amide I region of HSA alone and with the addition of 37.50 μM Cu(II) deconvoluted displaying an increase in α -helix conformation.

	HSA 7.4	+ 3.75 μM Cu(II)	+ 12.50 μM Cu(II)	+ 37.50 μM Cu(II)
β -sheet	15.94	11.89	11.72	7.70

α -helix	31.63	14.04	15.19	27.19
Random coils	----	----	22.18	----
β -turns	16.34	23.05	14.96	16.64
Antiparallel β	21.66	13.13	18.80	10.10

Table S4. Percentage analysis of different secondary structural elements obtained after deconvolution of the Amide I ($1600\text{--}1700\text{ cm}^{-1}$) region of HSA and with the addition of varying concentration of Cu(II) (pH 7.4).