Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Utilizing an Aggregate Forming Microenvironment Sensitive Coumarin-Cholesterol Conjugate as a Sensor of Pluronic Organization and Micro-polarity

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Table S1: Few important parameters of P123 and F127.

Trade name	P123	F127
Formula	PEO_{20}-PPO_{70}-PEO_{20}	PEO_{100}-PPO_{64}-PEO_{100}
Core size (Å)	42.1	37.5
Corona thickness (Å)	24.4	70.2
HLB	8	22

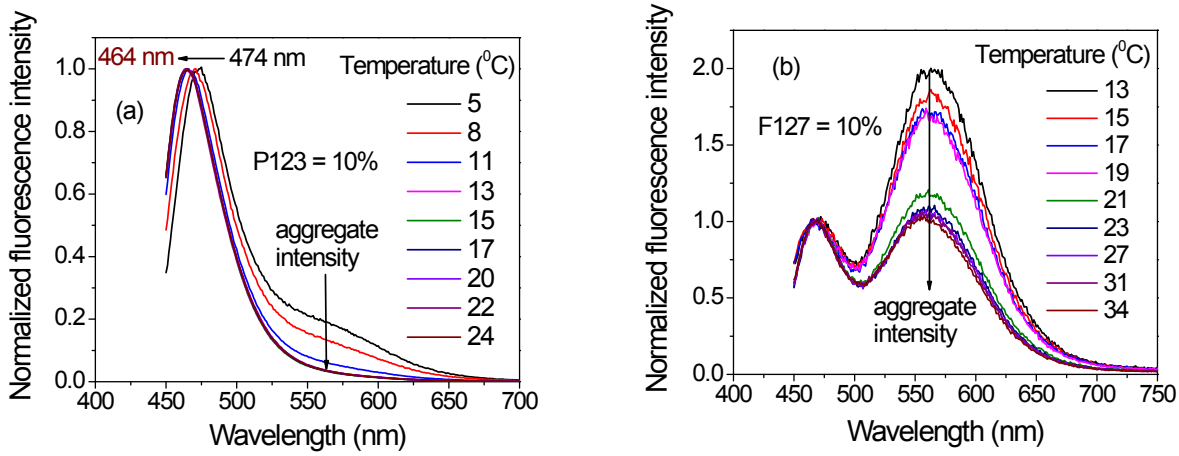


Figure S1: Normalized fluorescence spectra of Cum-Chl in presence of 10% (a) P123 and (b) F127 with increasing temperature; at λ_{ex} 440 nm.

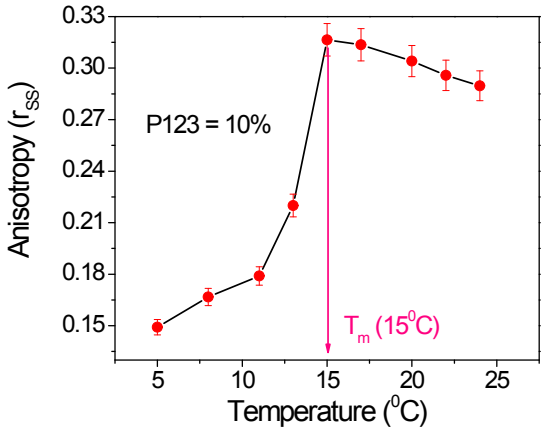
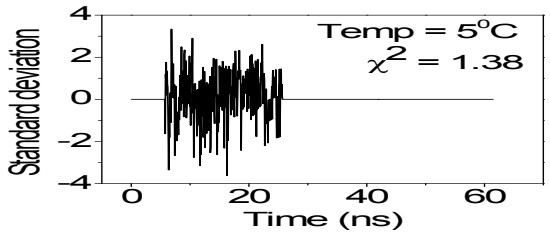
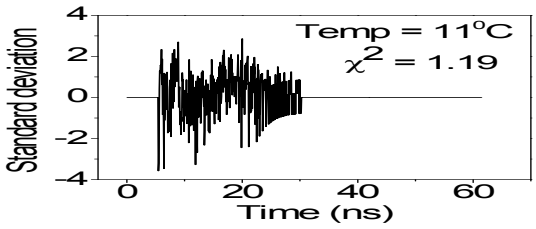


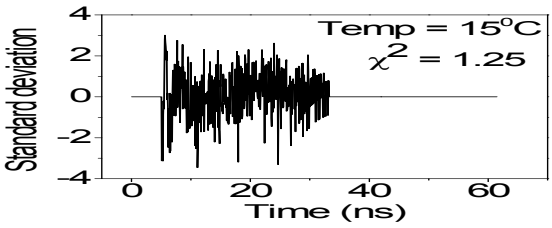
Figure S2: Variation of steady state fluorescence anisotropy (r_{SS}) of Cum-Chl monomer in presence of 10% P123 with increasing temperature; at λ_{ex} 440 nm.

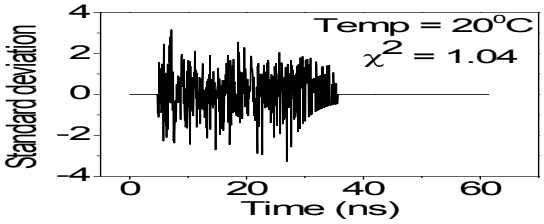
Table S2: Fluorescence lifetime data of Cum-Chl monomer and aggregate form in presence of 10% P123 with increasing temperature, (λ_{ex} = 444 nm, λ_{em} = 470 nm for monomer and λ_{ex} = 444 nm, λ_{em} = 566 nm for aggregate).

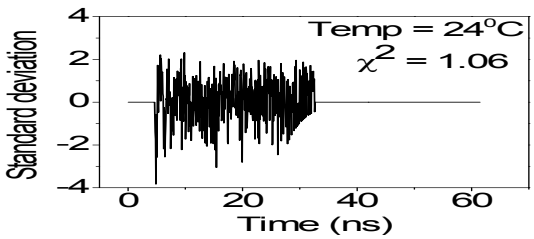
Temperature (°C)	τ_1 (ns) (β_1)	τ_2 (ns) (β_2)	τ_{aveg} (ns)	χ^2	
5	0.66 (0.89)	2.03 (0.11)	0.81	1.38	Monomer
11	0.43 (0.78)	2.05 (0.22)	0.79	1.19	
15	0.31 (0.57)	2.59 (0.43)	1.29	1.25	
20	0.98 (0.44)	2.66 (0.56)	1.92	1.04	
24	0.81 (0.48)	2.61 (0.52)	1.75	1.06	
5	7.83 (0.53)	26.46 (0.47)	16.59	1.22	Aggregate
11	4.87 (0.52)	25.83 (0.48)	14.93	1.34	
15	2.40 (0.92)	19.10 (0.08)	3.74	1.17	
20	2.11 (0.93)	18.45 (0.07)	3.25	1.30	
24	2.05 (0.93)	17.87 (0.07)	3.16	1.33	

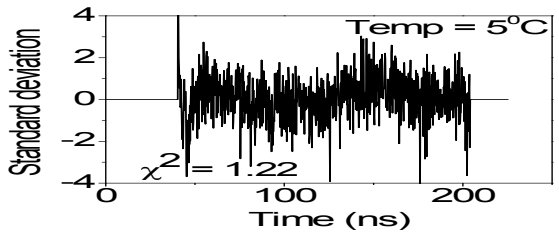

Temp = 5°C
χ^2 = 1.38
Standard deviation
Time (ns)

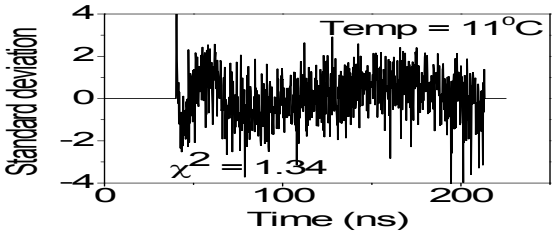

Temp = 11°C
χ^2 = 1.19
Standard deviation
Time (ns)

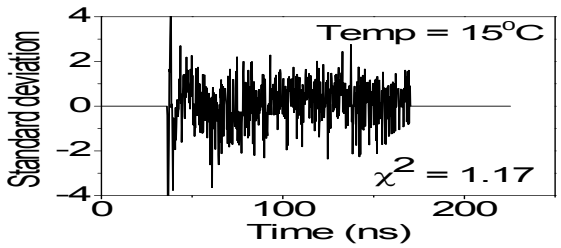

Temp = 15°C
χ^2 = 1.25
Standard deviation
Time (ns)

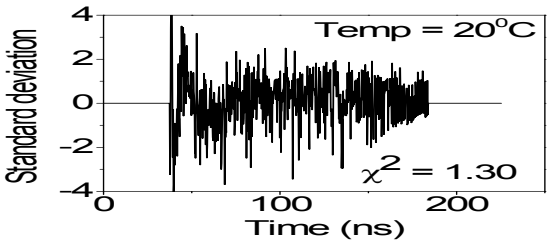

Temp = 20°C
χ^2 = 1.04
Standard deviation
Time (ns)


Temp = 24°C
χ^2 = 1.06
Standard deviation
Time (ns)


Temp = 5°C
χ^2 = 1.22
Standard deviation
Time (ns)


Temp = 11°C
χ^2 = 1.34
Standard deviation
Time (ns)


Temp = 15°C
χ^2 = 1.17
Standard deviation
Time (ns)


Temp = 20°C
χ^2 = 1.30
Standard deviation
Time (ns)

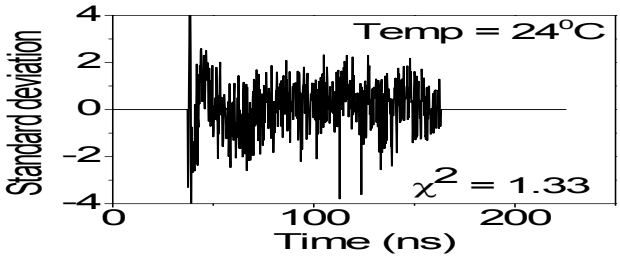


Figure S3: Residue distribution plots of Cum-Chl monomer and aggregate form in presence of 10% P123 with increasing temperature (corresponds to Table S2).

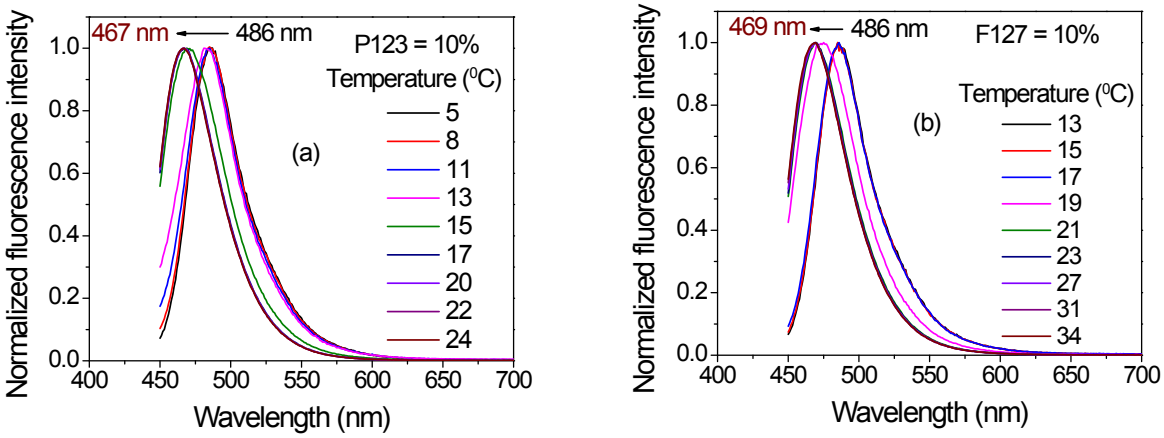


Figure S4: Normalized fluorescence spectra of Cum in presence of 10% (a) P123 and (b) F127 with increasing temperature; at λ_{ex} 440 nm.

Table S3: Fluorescence lifetime data of Cum in presence of 10% P123 with increasing temperature (λ_{ex} = 444 nm, λ_{em} = 480 nm).

Temperature (°C)	τ_1 (ns) (β_1)	τ_2 (ns) (β_2)	τ_{aveg} (ns)	χ^2
5	0.18 (0.99)	0.92 (0.01)	0.19	1.21
11	0.20 (0.99)	1.87 (0.01)	0.22	1.01
15	0.21 (0.96)	2.42 (0.04)	0.30	1.22
20	0.86 (0.63)	2.56 (0.37)	1.50	1.01
24	0.83 (0.63)	2.51 (0.37)	1.45	1.08

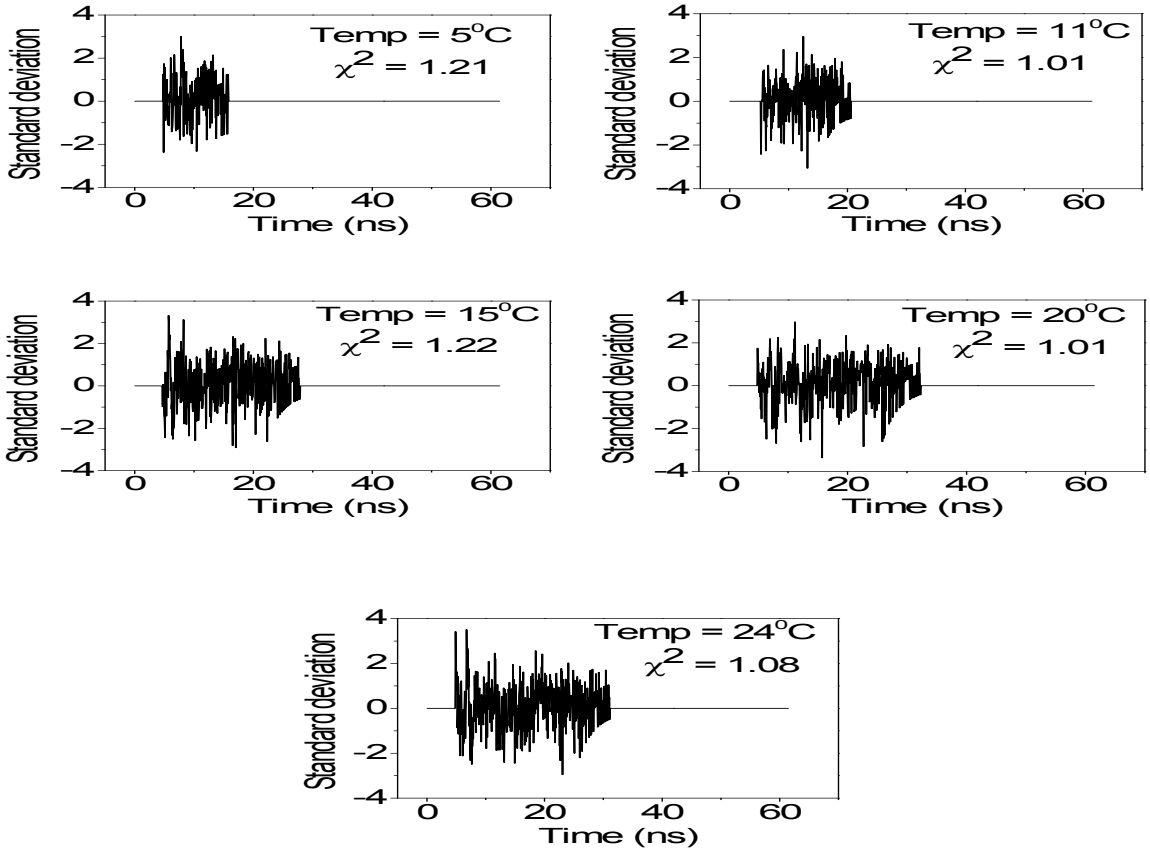


Figure S5: Residue distribution plots of Cum in presence of 10% P123 with increasing temperature (corresponds to Table S3).

Table S4: Fluorescence lifetime data of Cum in presence of 10% F127 with increasing temperature (λ_{ex} = 444 nm, λ_{em} = 480 nm).

Temperature (°C)	τ_1 (ns) (β_1)	τ_2 (ns) (β_2)	τ_{aveg} (ns)	χ^2
13	0.12 (0.99)	1.28 (0.01)	0.13	1.24
17	0.14 (0.99)	1.73 (0.01)	0.16	1.02
21	0.49 (0.76)	2.12 (0.24)	0.88	1.21
27	0.57 (0.74)	2.14 (0.26)	0.98	1.08
34	0.48 (0.76)	2.02 (0.24)	0.85	1.10

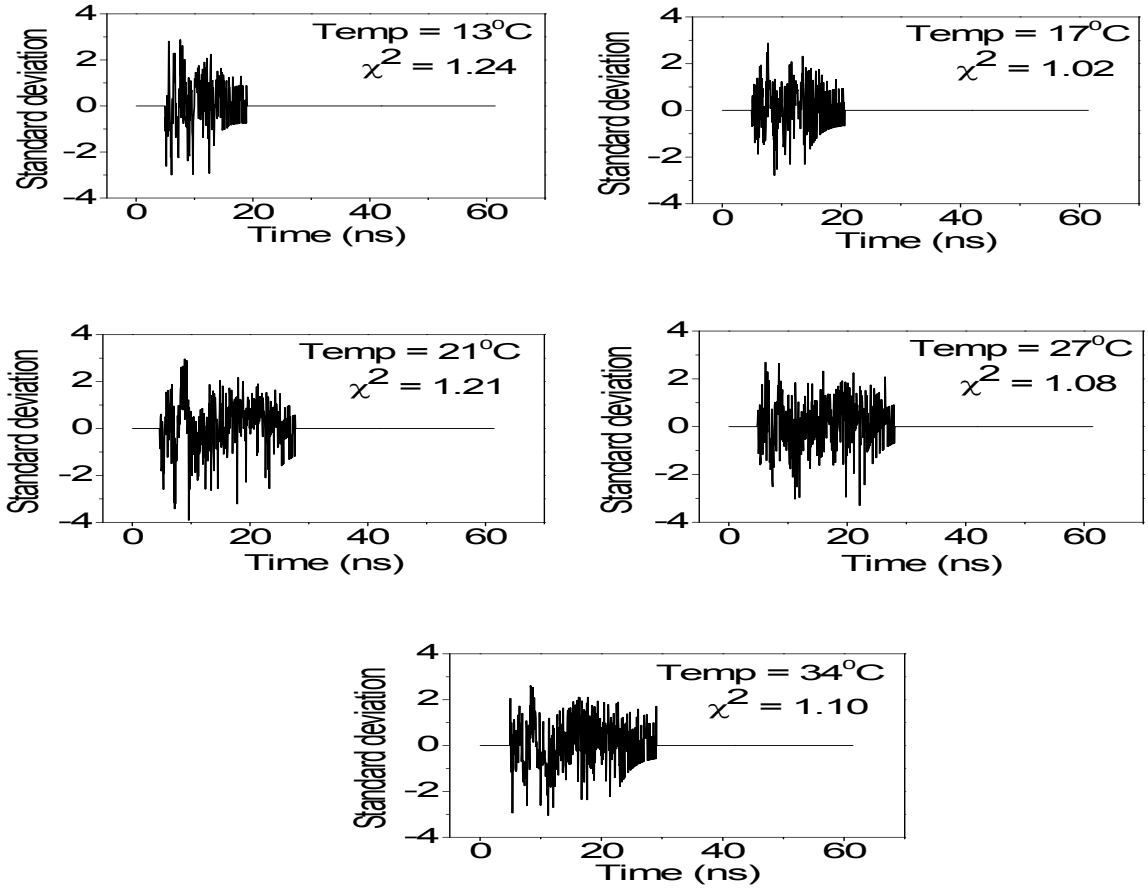


Figure S6: Residue distribution plots of Cum in presence of 10% F127 with increasing temperature (corresponds to Table S4).

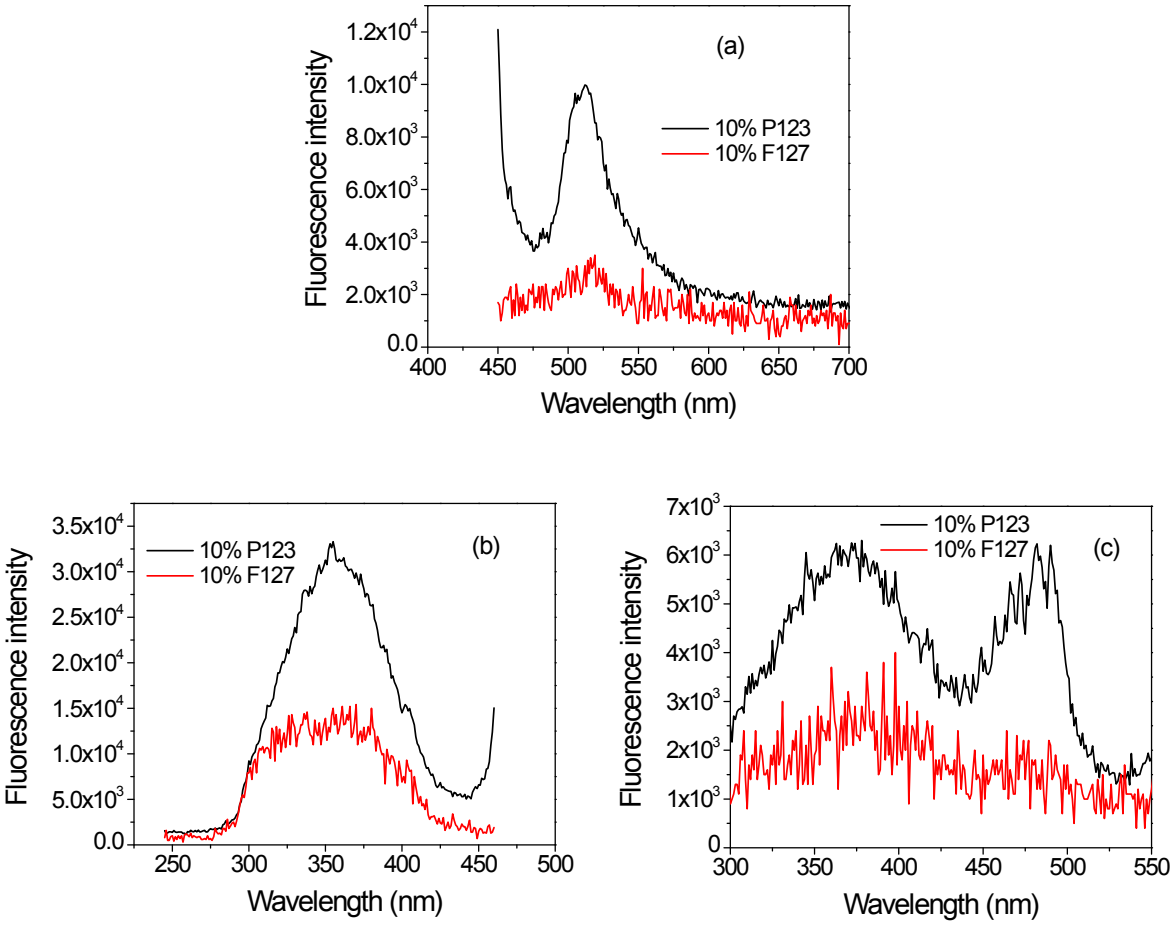
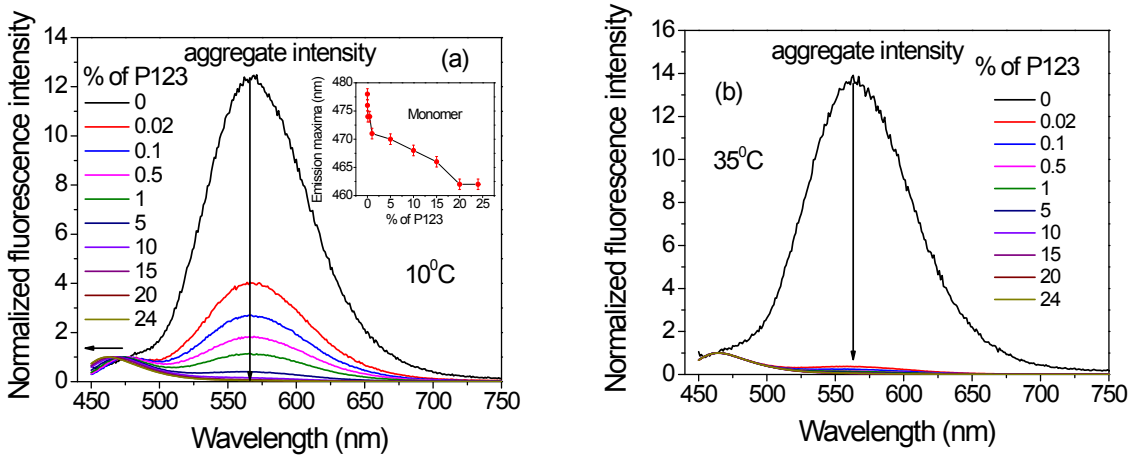


Figure S7: Intrinsic fluorescence of 10% P123 and F127, (a) emission spectra at λ_{ex} 440 nm, (b) excitation spectra at λ_{em} 470 nm and (c) excitation spectra at λ_{em} 566 nm.



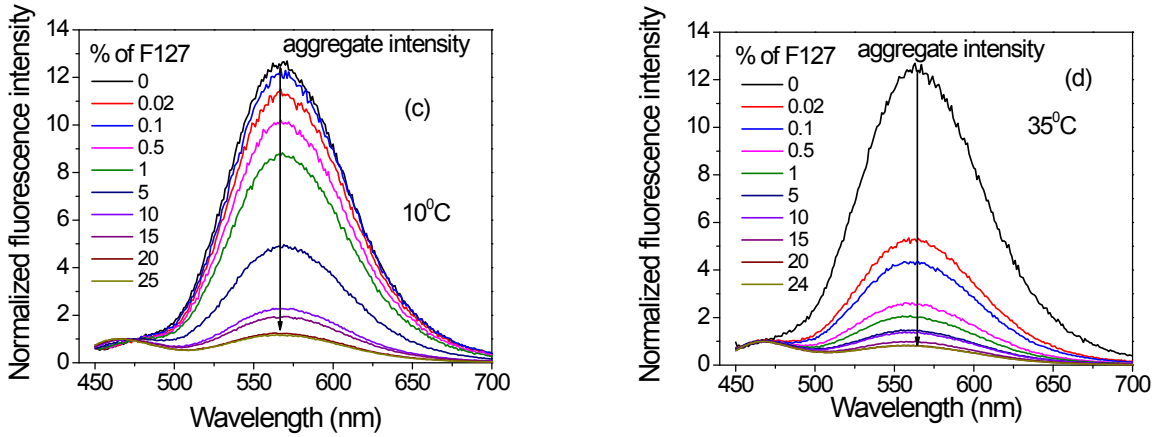


Figure S8: Normalized fluorescence spectra of Cum-Chl, with increasing % of P123 at (a) 10℃ and (b) 35℃ and with increasing % of F127 at (c) 10℃ and (d) 35℃; at λ_{ex} 440 nm.

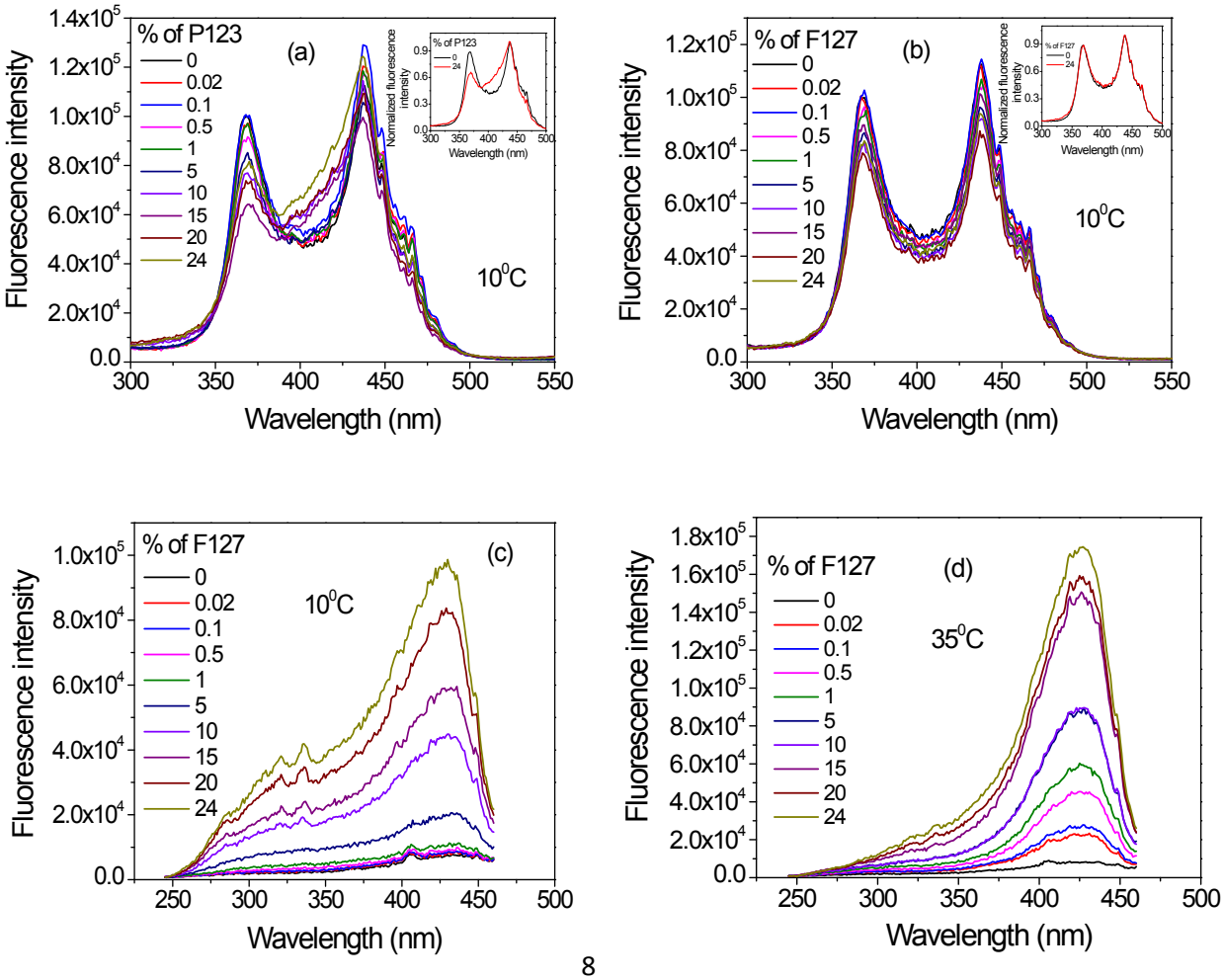


Figure S9: Fluorescence excitation spectra of Cum-Chl (λ_{em} = 566 nm) in presence of (a) P123 and (b) F127 at 10°C, inset shows normalized spectra, fluorescence excitation spectra of Cum-Chl (λ_{em} = 470 nm) in presence of F127 at (c) 10°C and (d) 35°C.

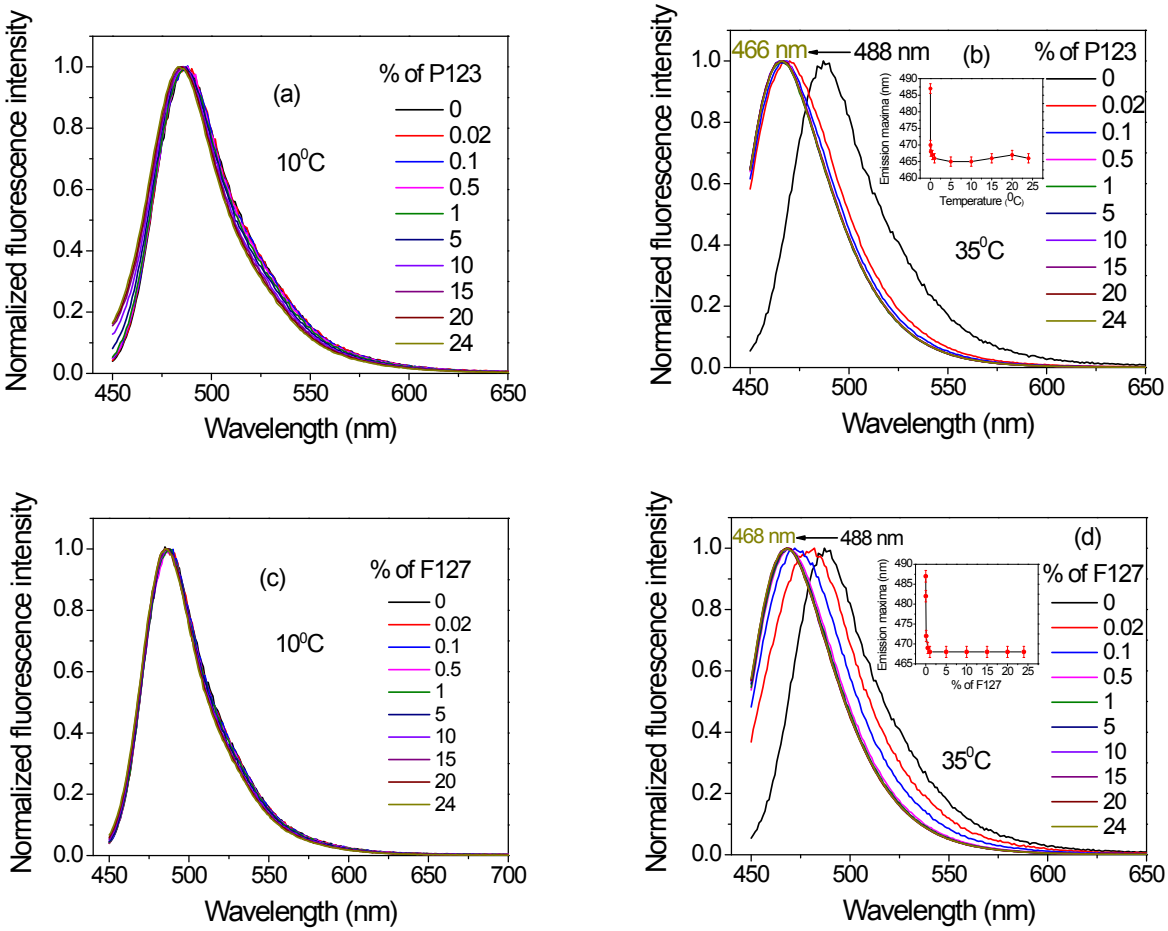


Figure 10: Normalized fluorescence spectra of Cum, with increasing % of P123 at (a) 10℃ and (b) 35℃ and with increasing % of F127 at (c) 10℃ and (d) 35℃; at λ_{ex} 440 nm.