Supporting Information

The Effect of a Mild Base on Curcumin in Methanol and Ethanol

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Supporting Information Available:

1. Steady-state and time-resolved emission data of curcumin.
2. Steady-state and time-resolved emission data of C153.
3. Absorption and emission spectra of curcumin in a basic solution.
4. Log normal spectral line shape function.
5. Time-resolved emission of curcumin in methanol acetate solutions.

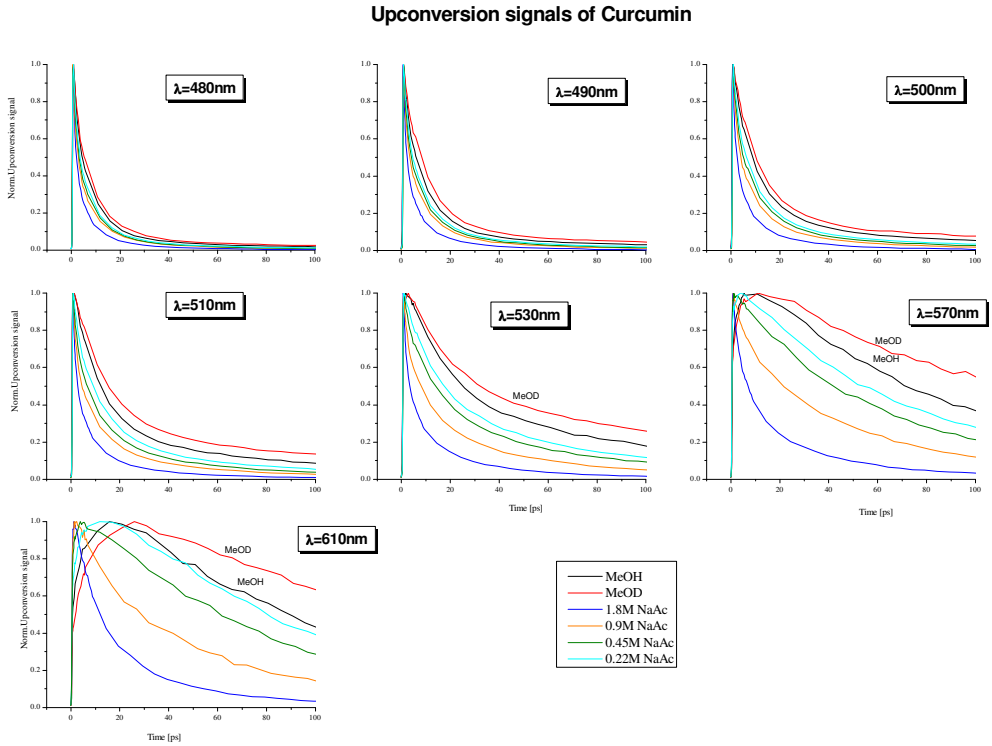

Figure s1.

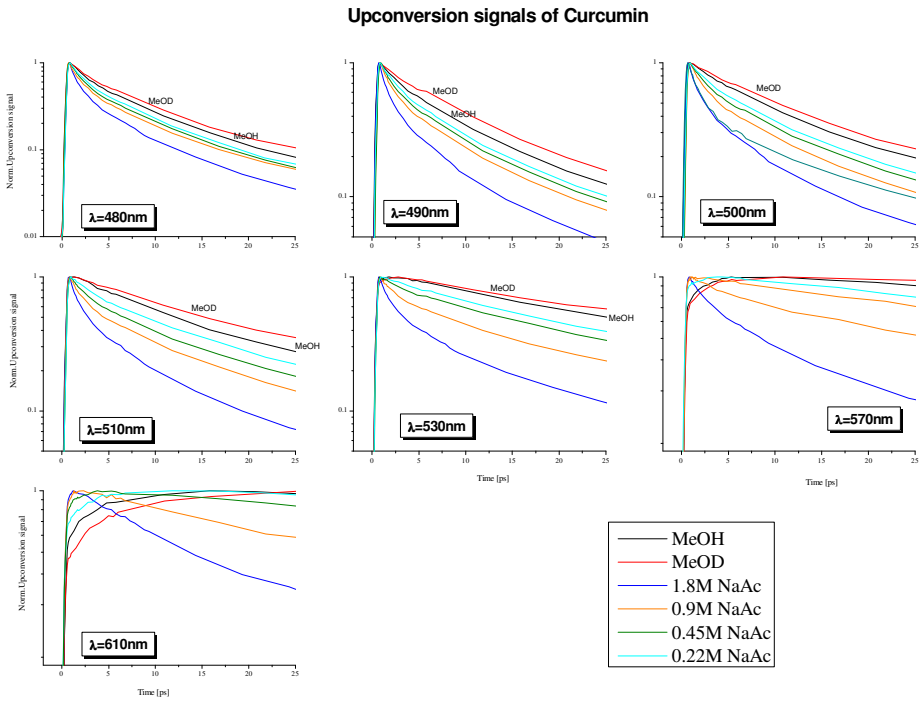

Figure s2.

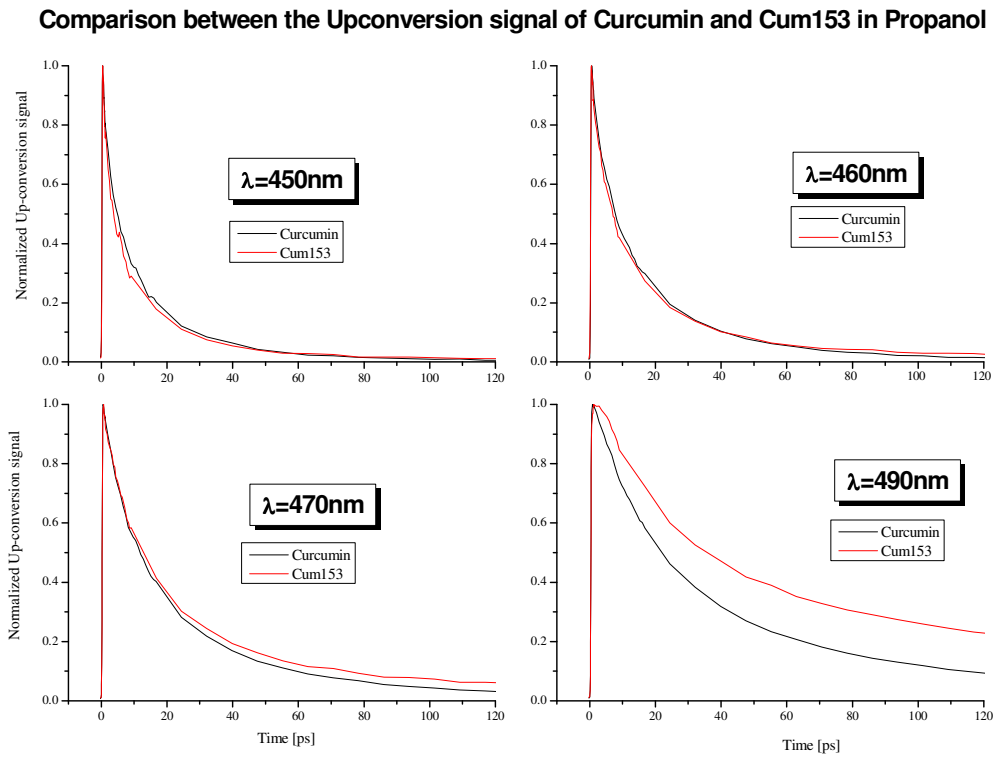
Comparison between the Upconversion signal of Curcumin and Cum153 in Propanol
Normalized Up-conversion signal
λ=450nm
Curcumin
Cum153
λ=460nm
Curcumin
Cum153
λ=470nm
Curcumin
Cum153
λ=490nm
Curcumin
Cum153
Time [ps]
Time [ps]

figure s3.

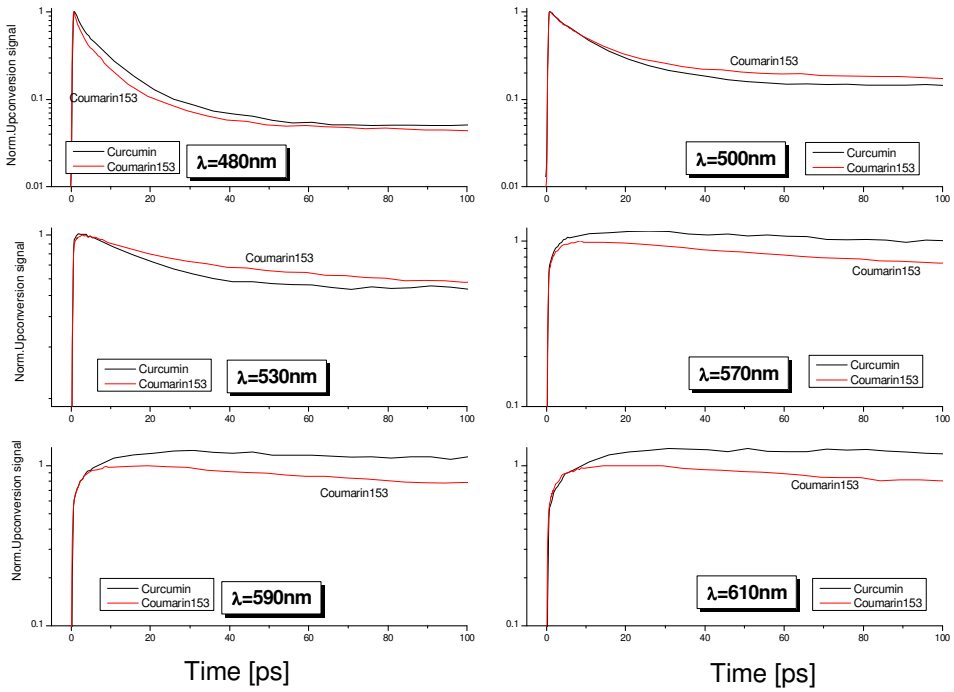

Figure s4.

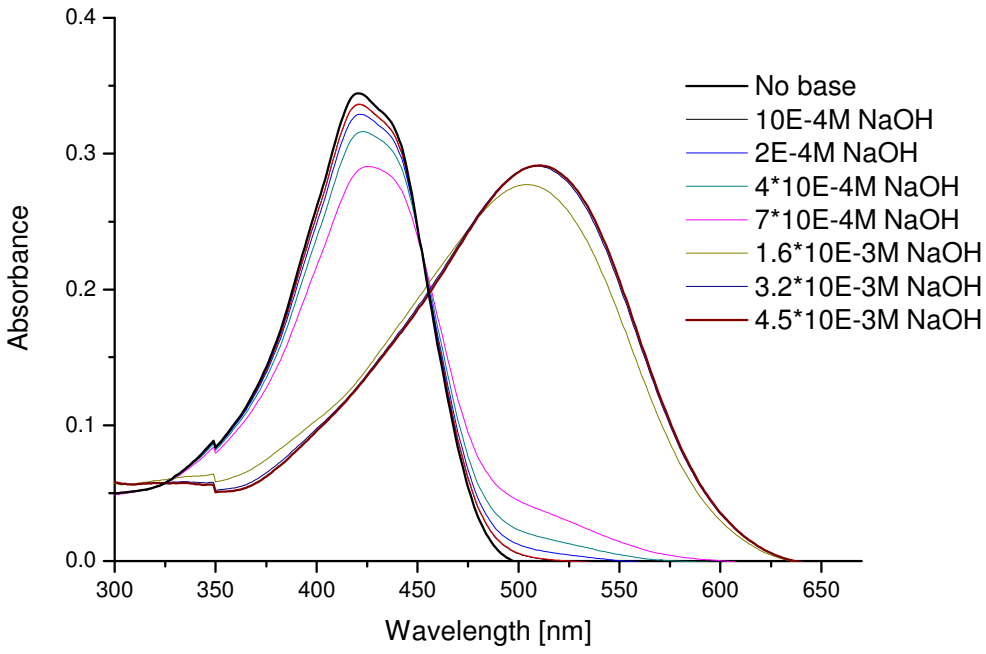

Figure s5. Absorption spectra of Curcumin in several basic solutions

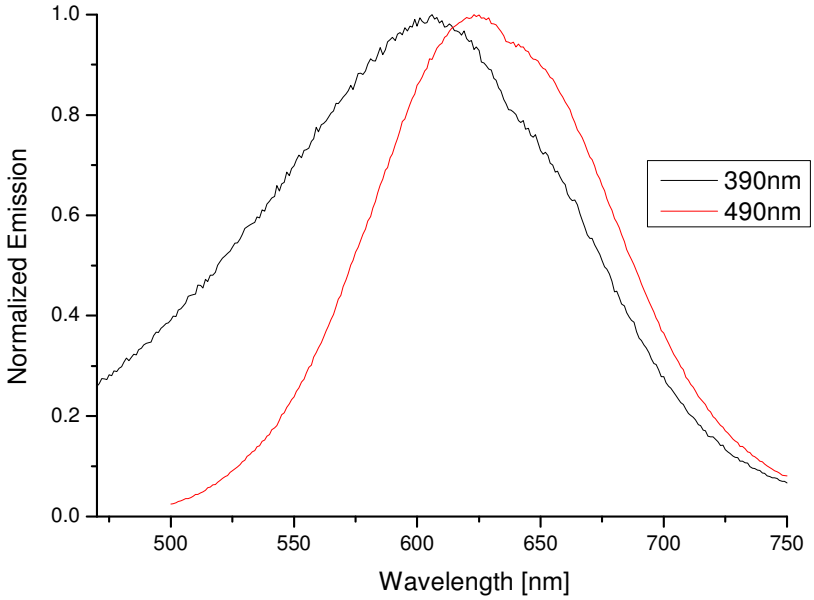

Figure s6. Steady state of Curcumin in MeOH basic solution pH~10 Emission spectra; Excitation at two different wavelengths.

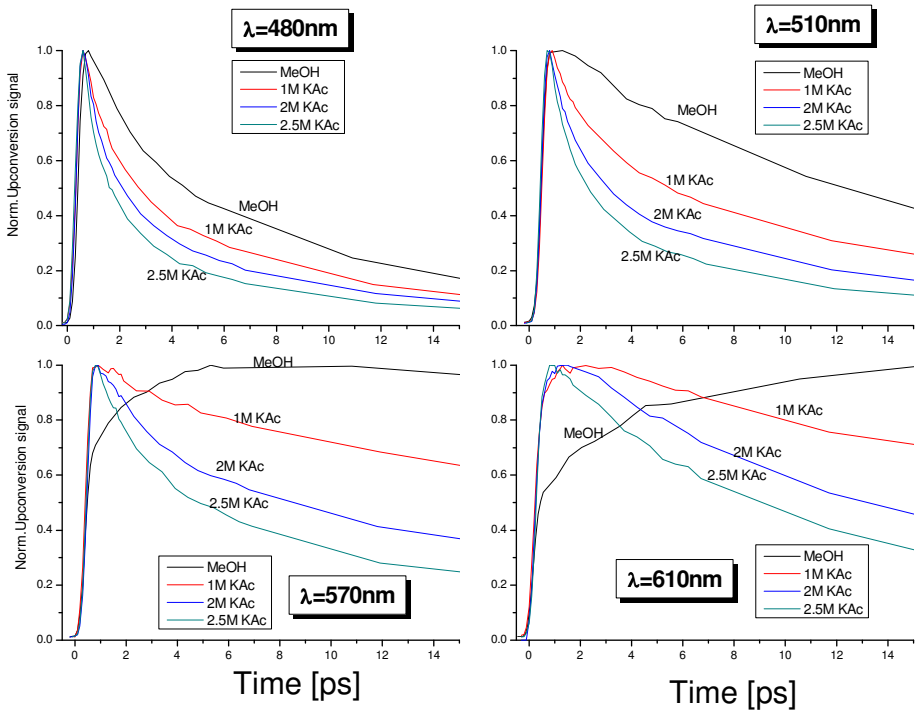

Figure s7a. Time-resolved fluorescence up-conversion signals of curcumin in methanol solutions of potassium acetate on linear scale.

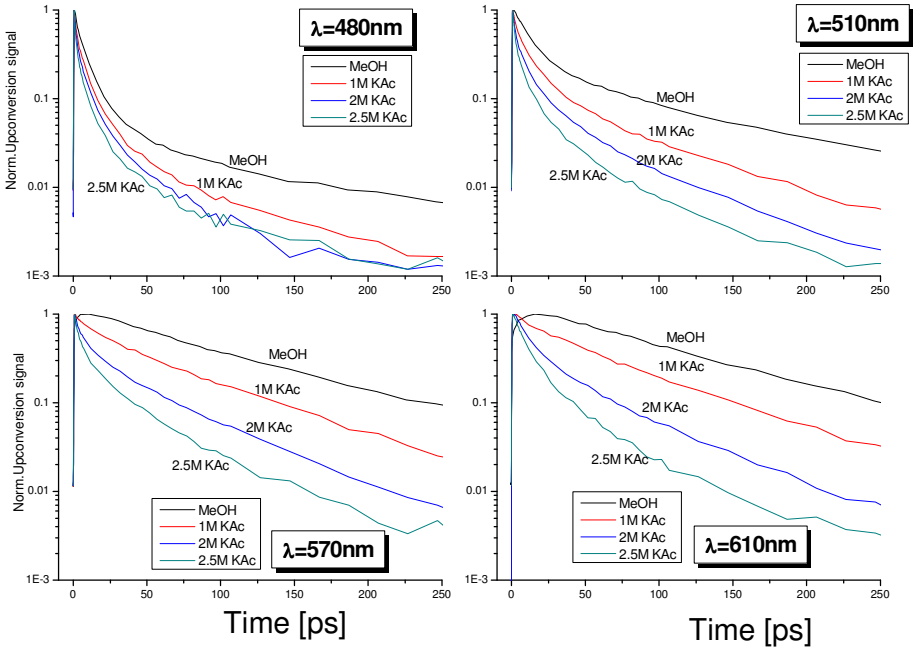

Figure s7b. Time-resolved fluorescence up-conversion signals of curcumin in methanol solutions of potassium acetate on semi-logarithmic scale.

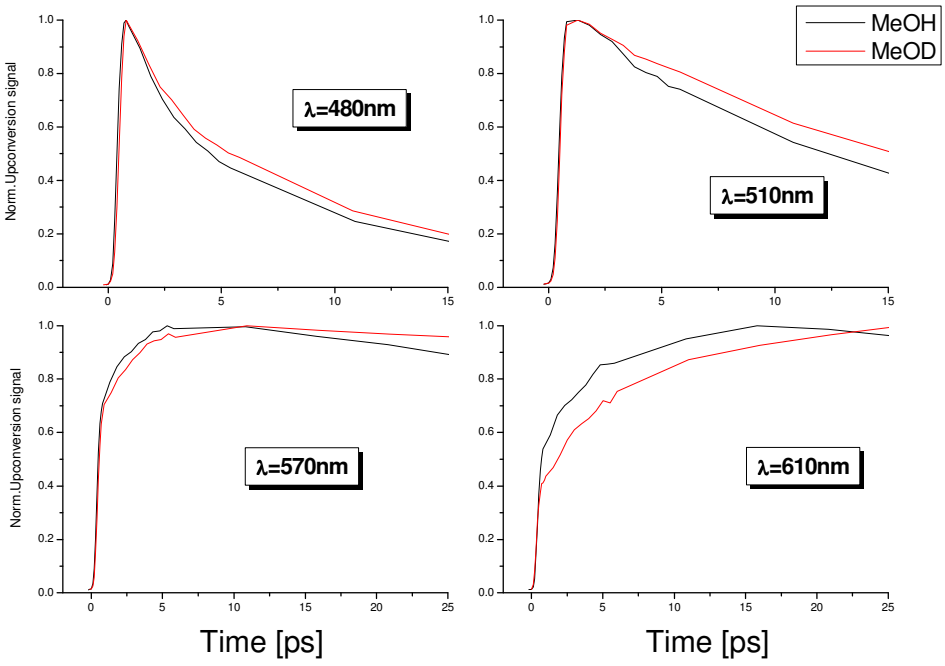

Figure s8a. Fluorescence up-conversion signals of curcumin in methanol and methanol-d at several wavelengths on linear scale.

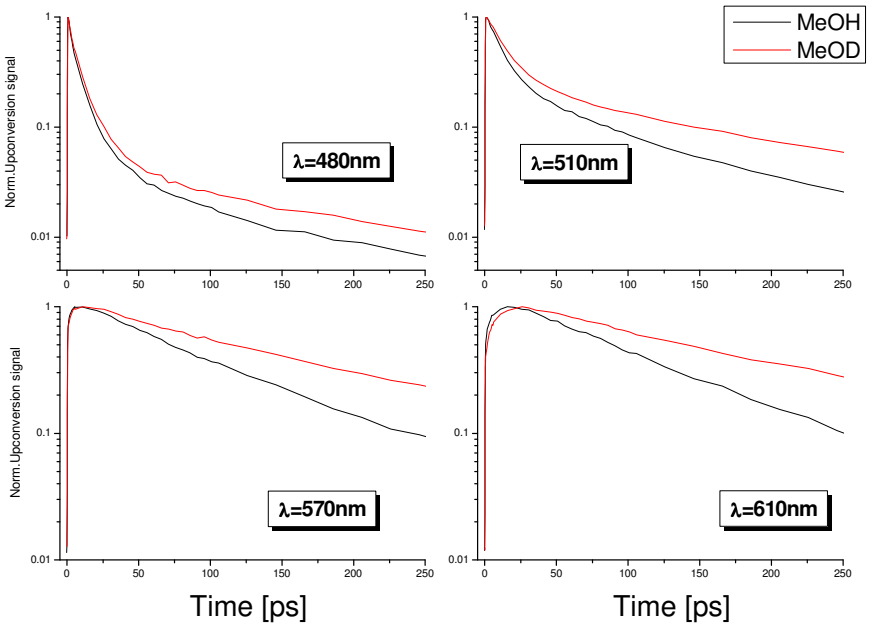

Figure s8b. Fluorescence up-conversion signals of curcumin in methanol and methanol-d at several wavelengths on semi-logarithmic scale

Table s1 Multi-stretched exponential fitting parameters of the fluorescence up-conversion signals of Curcumin with Methanol Acetate solution.

λ=480nm

Concentration	a_1	τ_1 (ps)	α_1	a_2	τ_2 (ps)	α_2	a_3	τ_3 (ps)	α_3
MeOH	0.39	2.8	0.8	0.56	7.8	0.77	0.04	100	0.7
MeOD	0.39	3.8	0.9	0.55	8.8	0.85	0.06	127	0.7
1.8M NaAc	0.54	0.63	0.7	0.42	4.8	0.77	0.03	28	0.7
0.9M NaAc	0.46	0.84	0.7	0.50	6.5	0.77	0.04	47	0.7
0.45M NaAc	0.40	1.0	0.9	0.55	6.9	0.83	0.05	50	0.7
0.22M NaAc	0.41	1.44	0.78	0.54	6.7	0.80	0.05	57	0.7

λ=490nm

Concentration	a_1	τ_1 (ps)	α_1	a_2	τ_2 (ps)	α_2	a_3	τ_3 (ps)	α_3
MeOH	0.29	4.5	0.99	0.59	8.0	0.74	0.12	57	0.59
1.8M NaAc	0.46	0.7	0.8	0.46	4.3	0.69	0.08	13.5	0.57
0.9M NaAc	0.34	1.05	0.88	0.56	5.8	0.73	0.10	23.5	0.57
0.45M NaAc	0.31	1.35	0.88	0.59	6.8	0.73	0.10	29.5	0.57
0.22M NaAc	0.25	1.95	0.88	0.62	6.5	0.77	0.13	29.5	0.57

λ=500nm

Concentration	a_1	τ_1 (ps)	α_1	a_2	τ_2 (ps)	α_2	a_3	τ_3 (ps)	α_3
MeOH	--	---	---	0.78	8.3	0.79	0.22	46	0.585
1.8M NaAc	0.46	0.75	0.88	0.46	5.4	0.7	0.08	16.5	0.57
0.9M NaAc	0.32	1.2	0.88	0.53	7.0	0.75	0.15	24	0.585
0.45M NaAc	0.24	1.7	0.88	0.59	7.6	0.75	0.17	29	0.585
0.22M NaAc	0.18	2.3	0.88	0.61	8.0	0.75	0.21	33	0.585

λ=510nm

Concentration	a_1	τ_1 (ps)	α_1	a_2	τ_2 (ps)	α_2	a_3	τ_3 (ps)	α_3
MeOH	---	---	---	0.59	11.3	0.98	0.41	42	0.585
1.8M NaAc	0.45	0.85	0.88	0.45	5.8	0.73	0.10	17	0.585
0.9M NaAc	0.26	1.05	0.88	0.51	7.5	0.75	0.23	23	0.585
0.45M NaAc	0.21	1.55	0.88	0.52	8.5	0.75	0.27	27	0.585

0.22M NaAc	---	---	---	0.59	7.0	0.85	0.41	29	0.585

λ=530nm

Concentration	a_1	τ_1 (ps)	α_1	a_2	τ_2 (ps)	α_2	a_3	τ_3 (ps)	α_3
1.8M NaAc	0.36	1.1	0.7	0.60	6.0	0.54	0.04	42	0.7
0.9M NaAc	0.26	3.3	0.85	0.69	14.2	0.55	0.05	42	0.7
0.45M NaAc	0.13	7.0	0.95	0.82	23.2	0.6	0.05	42	0.7
0.22M NaAc	0.05	26.0	0.95	0.88	22.2	0.55	0.07	58	0.7

Table s2 Multi-stretched exponential fitting parameters of the fluorescence up-conversion signals of Curcumin with Ethanol Acetate solution.

λ [nm]	a_1	τ_1 (ps)	α_1	a_2	τ_2 (ps)	α_2	a_3	τ_3 (ps)	α_3
470	0.51	1.6	0.7	0.46	9.6	0.69	0.03	43	0.7
480	0.48	1.6	0.7	0.48	12.2	0.69	0.04	73	0.7
510	0.39	1.6	0.7	0.55	20.2	0.7	0.06	175	0.7
530	0.36	2.2	0.7	0.57	30.0	0.7	0.07	175	0.7
570	0.28	6.0	0.7	0.61	45.0	0.7	0.1	225	0.7

Steady-State and Time-Resolved Emission Data Analysis

We used a log-normal line-shape function with four adjustable parameters to fit the individual bands.

$$I(\nu) = h\begin{cases}\exp[-\ln(2)\{\ln(1+\alpha)/\gamma\}^2] & \alpha > -1 \\ 0 & \alpha \le -1\end{cases} \quad (1)$$

$$\alpha \equiv 2\gamma(\nu - \nu_p)/\Delta \quad (2)$$

where $\upsilon_p, h, \Delta, \gamma$ are the peak position, amplitude, width and asymmetry, respectively. When $\gamma = 0$, the line-shape is Gaussian.