Supplementary Information

Fluorescence Properties of Systems with Multiple Förster Transfer Pairs

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Table S-1: list of abbreviations

$I_{transmitted}$	transmitted light
$I_{incident}$	incident light
$I_{detected}$	the intensities of (fluorescence) light detected at the detector
d	length of the optical path through the sample
i,j	indices signifying individual dyes, e.g. dye 1, dye 2, etc.;
ε_i	molar absorption coefficient of dye i
c_i	molar concentration of the dye i.
λ	wavelength
$f_i(\lambda)$	fluorescence quantum yield of emission within a wavelength rage of λ and λ+dλ.
λ_α, λ_β, λ_γ,	predefined wavelengths chosen by the experimentalist to characterize the fluorescent properties of his system.
R_α, R_β, R_γ,	intensity ratios chosen by the experimentalist
$F_i(\lambda)$	fluorescence efficiency; comprises $f_i(\lambda)$ and all those instrumentation parameters that will cancel out in Eq. (7)-(9).
p_{ij}	probability of Förster transfer of excitation from Donor i to acceptor j
$(1-p_{ij})$	probability of deactivation of the donor via either spontaneous emission or non-radiative decay
τ_D	lifetime of the excited state of the donor in absence of the acceptor,
$n_{D\rightarrow A}$,	rate of transfer from donor to acceptor
r_{ij}	Förster radius, the distance between donor and acceptor at which the rate of transfer is equal to the rate of deactivation of the donor
c_{ij}	critical transfer concentration [molecules per volume] characteristic for donor-acceptor pair $i \rightarrow j$
K_i	rate constant for quenching (Stern Vollmer eq.)
p_{ii}	probability for self-quenching of the donor
P_i	probability (in presence of self quenching) of the excitation neither being transferred from an excited donor to an acceptor nor being self-quenched
P_{ij}	probability of energy transfer from the donor i to the acceptor j (in Presence of self quenching or other acceptors than j)
g_{ij}	probability that excitation transferred from donor i to acceptor j is emitted as light.
p_{jj}	probability of self-quenching of the acceptor.
FL	Fluorescein
ES	Eosin
RB	Rhodamine B
AOT	bis(2-ethylhexyl) sulfosuccinate sodium salt

Table S-2a:

Rα as a function of C2 and C3

(Datasets graphically represented in figure 11a)

Upper line: exponential representation

Middle line: Stern-Vollmer equation

Bottom line: experimental data

C_3 [10^{-5} mol L^{-1}] \ Rα	C_2 [10^{-5} mol L^{-1}] 0	1	2	3	4	5	6
	0.748	0.662	0.593	0.536	0.487	0.446	0.410
	0.749	0.663	0.594	0.538	0.492	0.453	0.419
0	0.752	0.663	0.602	0.543	0.490	0.457	0.423
	0.688	0.616	0.556	0.505	0.462	0.424	0.392
	0.693	0.621	0.563	0.514	0.473	0.437	0.406
2	0.713	0.620	-	-	-	-	-
	0.641	0.579	0.526	0.481	0.441	0.407	0.377
	0.648	0.587	0.536	0.493	0.455	0.423	0.394
4	0.674	-	0.543	-	-	-	-
	0.603	0.547	0.5	0.459	0.423	0.391	0.363
	0.610	0.556	0.512	0.473	0.439	0.409	0.383
6	0.635	-	-	0.486	-	-	-
	0.569	0.520	0.477	0.439	0.406	0.376	0.350
	0.576	0.529	0.489	0.454	0.423	0.395	0.371
8	0.603	-	-	-	0.435	-	-
	0.539	0.494	0.455	0.420	0.390	0.362	0.338
	0.547	0.505	0.468	0.436	0.407	0.382	0.359
10	0.568	-	-	-	-	0.399	-
	0.512	0.471	0.435	0.403	0.374	0.349	0.325
	0.520	0.482	0.449	0.419	0.392	0.369	0.347
12	0.541	-	-	-	-	-	0.359

Table S-2b:

R_β as a function of C2 and C3

(Datasets graphically represented in figure 11b)

Upper line: exponential representation

Middle line: Stern-Vollmer equation

Bottom line: experimental data

R_β — C_3 [10^{-5} mol L^{-1}] \ C_2 [10^{-5} mol L^{-1}]	0	1	2	3	4	5	6
	0.208	0.275	0.329	0.373	0.411	0.443	0.471
	0.207	0.274	0.328	0.371	0.408	0.438	0.465
0	0.206	0.274	0.325	0.368	0.410	0.440	0.466
	0.204	0.261	0.308	0.348	0.382	0.411	0.436
	0.200	0.256	0.303	0.341	0.373	0.401	0.426
2	0.186	0.253					
	0.198	0.248	0.29	0.325	0.355	0.382	0.405
	0.194	0.242	0.282	0.316	0.346	0.371	0.393
4	0.172		0.272				
	0.191	0.235	0.273	0.305	0.332	0.357	0.378
	0.188	0.23	0.266	0.296	0.322	0.345	0.365
6	0.159			0.276			
	0.185	0.224	0.258	0.287	0.312	0.334	0.354
	0.184	0.221	0.252	0.279	0.302	0.323	0.341
8	0.147				0.281		
	0.179	0.214	0.244	0.271	0.294	0.314	0.332
	0.18	0.212	0.24	0.264	0.285	0.303	0.320
10	0.137					0.279	
	0.174	0.205	0.232	0.256	0.277	0.296	0.312
	0.176	0.205	0.229	0.251	0.270	0.286	0.302
12	0.128						0.270

Table S-2c:

Rγ as a function of C2 and C3

(Datasets graphically represented in figure 11c)

Upper line: exponential representation

Middle line: Stern-Vollmer equation

Bottom line: experimental data

Rγ; C_3 [10^{-5} mol L^{-1}] \ C_2 [10^{-5} mol L^{-1}]	0	1	2	3	4	5	6
	0.044	**0.063**	**0.078**	**0.09**	**0.102**	**0.111**	**0.120**
	0.044	**0.063**	**0.078**	**0.09**	**0.101**	**0.109**	**0.117**
0	**0.042**	**0.063**	**0.073**	**0.089**	**0.100**	**0.103**	**0.116**
	0.109	**0.123**	**0.136**	**0.147**	**0.156**	**0.165**	**0.173**
	0.108	**0.122**	**0.134**	**0.145**	**0.154**	**0.161**	**0.168**
2	**0.101**	**0.127**	**-**	**-**	**-**	**-**	**-**
	0.161	**0.173**	**0.184**	**0.194**	**0.203**	**0.211**	**0.218**
	0.159	**0.171**	**0.182**	**0.191**	**0.199**	**0.206**	**0.213**
4	**0.155**	**-**	**0.185**	**-**	**-**	**-**	**-**
	0.206	**0.217**	**0.227**	**0.236**	**0.245**	**0.252**	**0.259**
	0.202	**0.213**	**0.223**	**0.231**	**0.239**	**0.246**	**0.252**
6	**0.206**	**-**	**-**	**0.238**	**-**	**-**	**-**
	0.246	**0.256**	**0.266**	**0.274**	**0.282**	**0.29**	**0.296**
	0.24	**0.25**	**0.259**	**0.268**	**0.275**	**0.282**	**0.288**
8	**0.250**	**-**	**-**	**-**	**0.284**	**-**	**-**
	0.282	**0.291**	**0.3**	**0.309**	**0.317**	**0.324**	**0.331**
	0.273	**0.283**	**0.292**	**0.3**	**0.308**	**0.315**	**0.321**
10	**0.295**	**-**	**-**	**-**	**-**	**0.322**	**-**
	0.314	**0.324**	**0.333**	**0.341**	**0.349**	**0.356**	**0.362**
	0.303	**0.313**	**0.322**	**0.33**	**0.338**	**0.345**	**0.351**
12	**0.331**	**-**	**-**	**-**	**-**	**-**	**0.372**

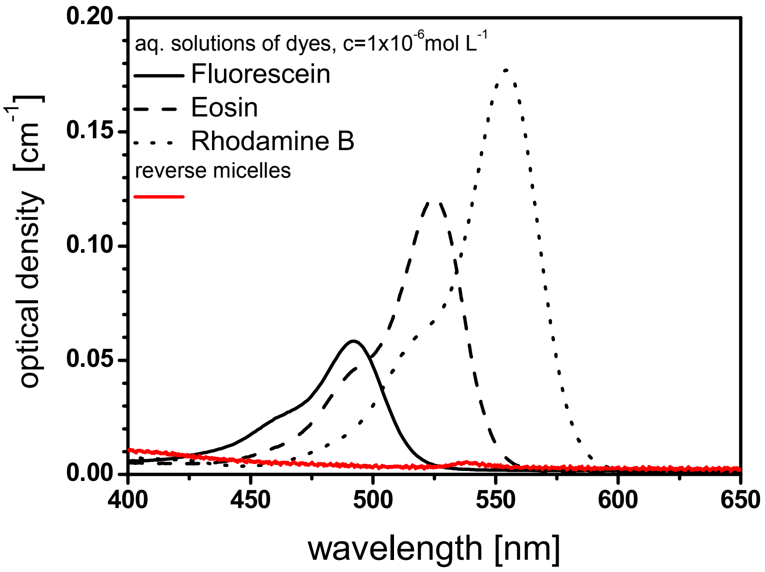

Figure S-1:

Comparison of the optical density [= lg(I_0/I)/(path length)] of diluted aqueous solution of the dyes used in the experiments to the optical density of a dispersion of reverse micelles in isooctane prepared at identical conditions as described in the main paper: in the experiments conducted here, attenuation due to scattering is negligible compared to attenuation due to absorption.