Supplementary Information for

Solvent-assisted optical modulation of FRET-induced fluorescence for efficient conjugated polymer-based DNA detection

Mijeong Kang,[a] Okhil Kumar Nag,[a] Sungu Hwang,[a] Inhong Kim,[b] Haesik Yang,[c] Kwangseuk Kyhm[d] and Han Young Woo*[ae]

[a] Department of Nanofusion Technology (BK21), Pusan National University, Miryang 627-706, Republic of Korea. [b] Department of Physics, Pusan National University, Busan 609-735, Republic of Korea. [c] Department of Chemistry, Pusan National University, Busan 609-735, Republic of Korea. [d] Department of Physics Education, RCDAMP, Pusan National University, Busan 609-735, Republic of Korea. [e] Department of Cogno-Mechatronics Engineering (WCU), Pusan National University, Miryang 627-706, Republic of Korea. Tel:82-55-350-5300; Fax: 82-55-350-5279; E-mail: hywoo@pusan.ac.kr

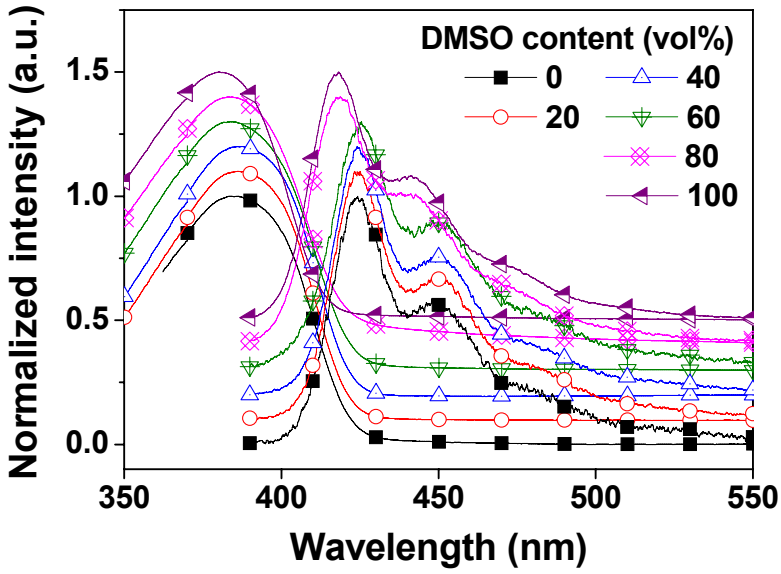

Fig. S1 Normalized absorption and PL spectra of **FPQ** with increasing DMSO mixing ratio in PBS/DMSO mixtures.

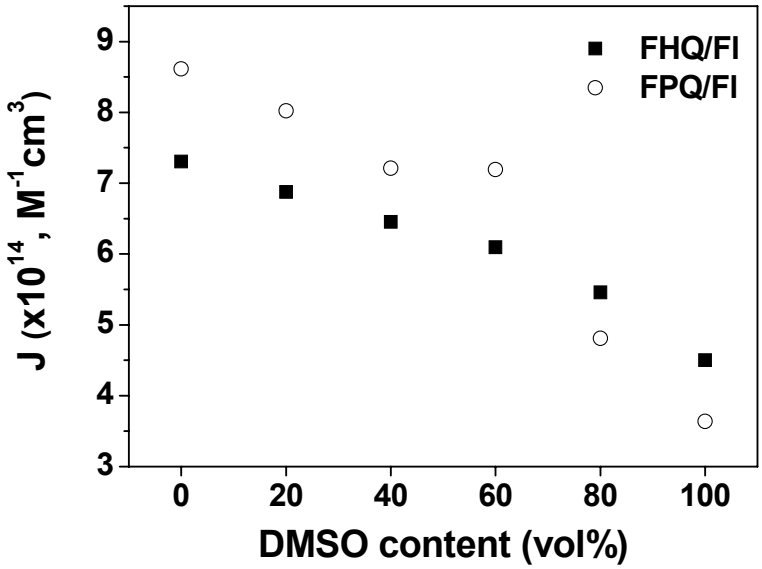

Fig. S2 Spectral overlap between polymer's emission and absorption of fluorescein in PBS/DMSO mixtures.

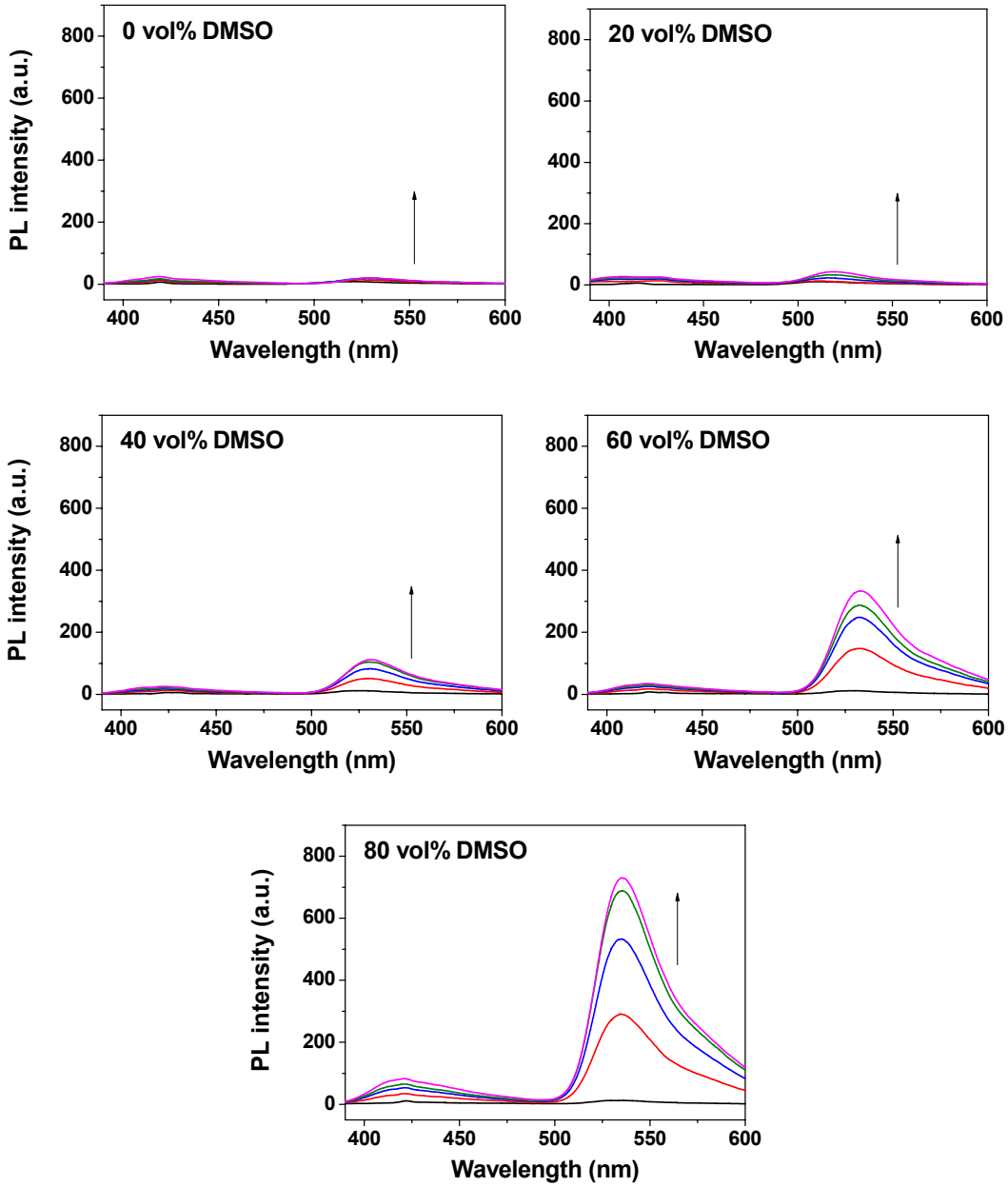

Fig. S3 FRET-induced PL spectra of **FHQ**/ssDNA-Fl with increasing [**FHQ**] in PBS/DMSO mixtures. [ssDNA-Fl] = 2.5 × 10^{-8} M and [**FHQ**] = 0 to 4.0 × 10^{-7} M. All spectra were obtained by exciting at 380 nm.

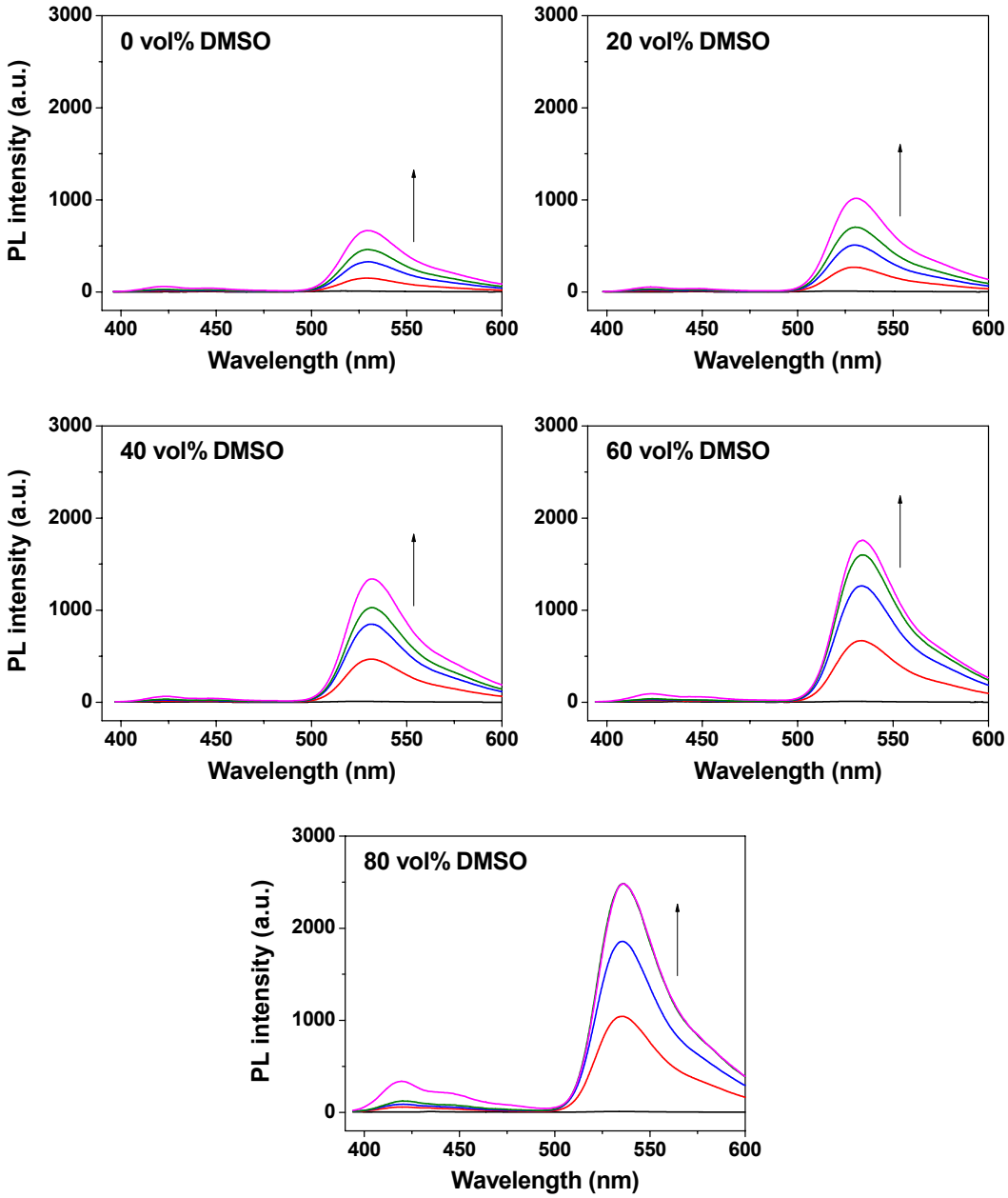

Fig. S4 FRET-induced PL spectra of **FPQ**/ssDNA-Fl with increasing [**FPQ**] in PBS/DMSO mixtures. [ssDNA-Fl] = 2.5 × 10^{-8} M and [**FPQ**] = 0 to 7.9 × 10^{-7} M. All spectra were obtained by exciting at 380 nm.

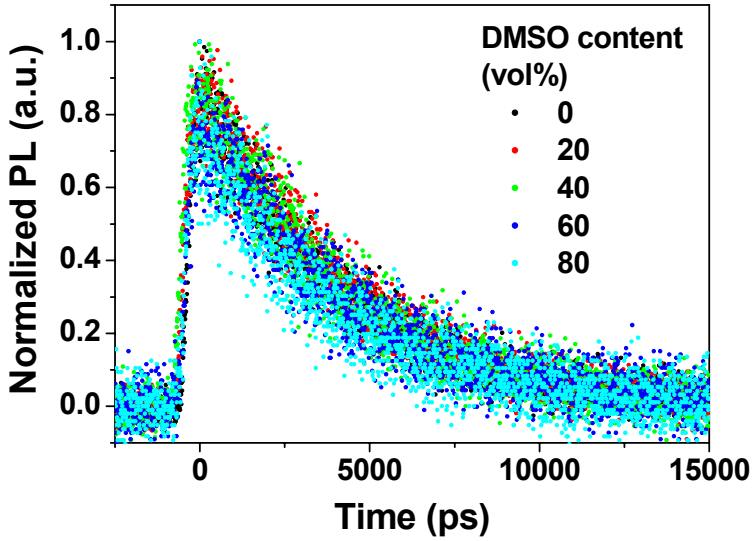

Fig. S5 Time-resolved PL decay of ssDNA-Fl in the absence of polymers in different PBS/DMSO mixtures.

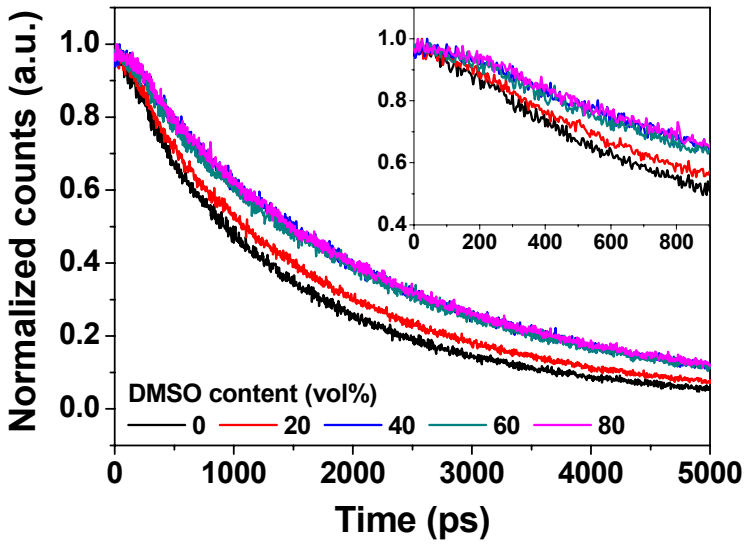

Fig. S6 Time-resolved PL decay of ssDNA-Fl in the presence of **FPQ** in different PBS/DMSO mixtures. [ssDNA-Fl] = 2.5×10^{-8} M, [**FPQ**] = 7.9×10^{-7} M ([+]/[-] = 3.2). The PL signal decay was measured at λ_{PL} of Fl (515 ~ 532 nm) in different PBS/DMSO mixtures (λ_{ex} = 404 nm).

Table S1. Summary of time-resolved PL spectroscopy of ssDNA-Fl upon complexation with **FPQ** in PBS/DMSO mixtures.

DMSO (vol%)	A_1	τ_1 (ps)	A_2	τ_2 (ps)	$<\tau>$ (ps)
0	0.61	690	0.39	2,250	1,740
20	0.48	720	0.52	2,340	1,980
40	0.55	1,040	0.45	3,090	2,490
60	0.44	990	0.56	2,840	2,440
80	0.53	1,100	0.47	3,190	2,610

$<\tau> = (A_1\tau_1^2 + A_2\tau_2^2) / (A_1\tau_1 + A_2\tau_2)$. A_1 and A_2 are the amplitudes, τ_1 and τ_2 are the PL lifetimes of the first and the second PL decay of ssDNA-Fl in the presence of **FPQ**, respectively. [ssDNA-Fl] = 2.5×10^{-8} M, [**FPQ**] = 7.9×10^{-7} M.