Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

An Enzymatically-Sensitized Sequential and Concentric Energy Transfer Relay Self-Assembled Around Semiconductor Quantum Dots

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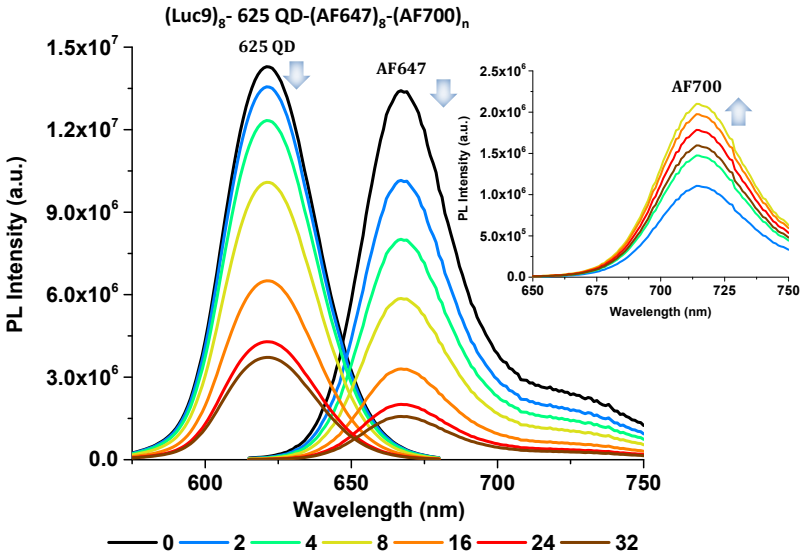
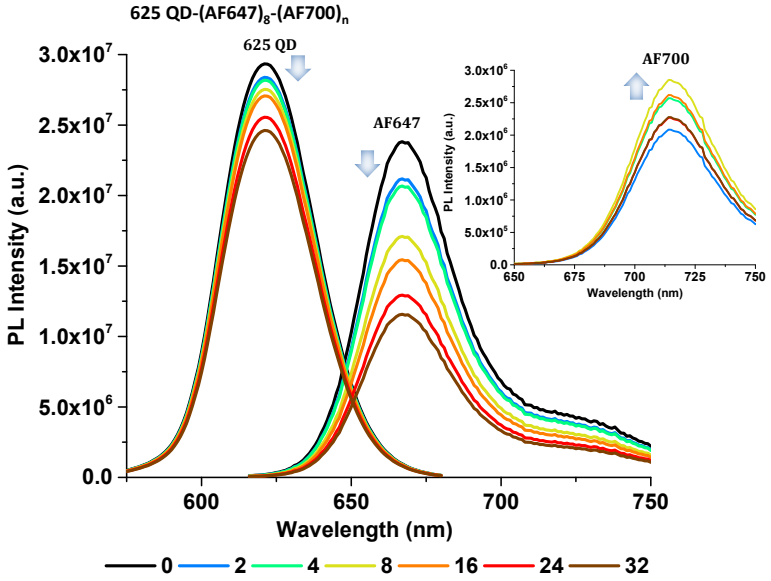
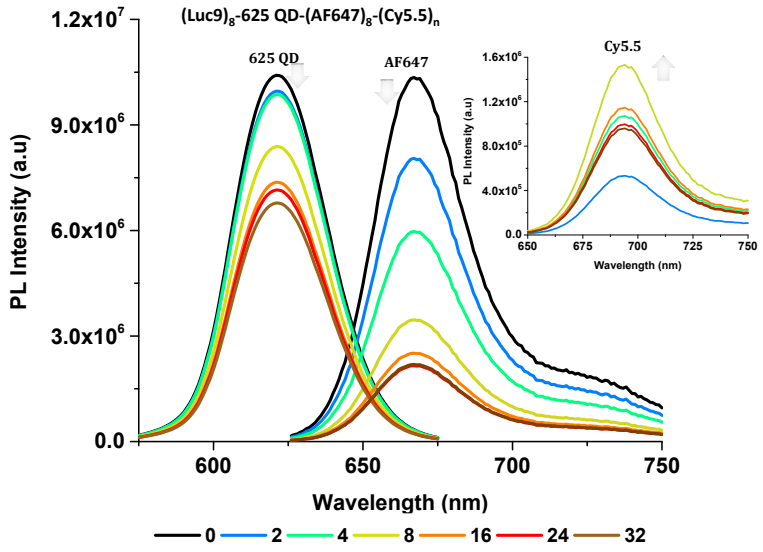


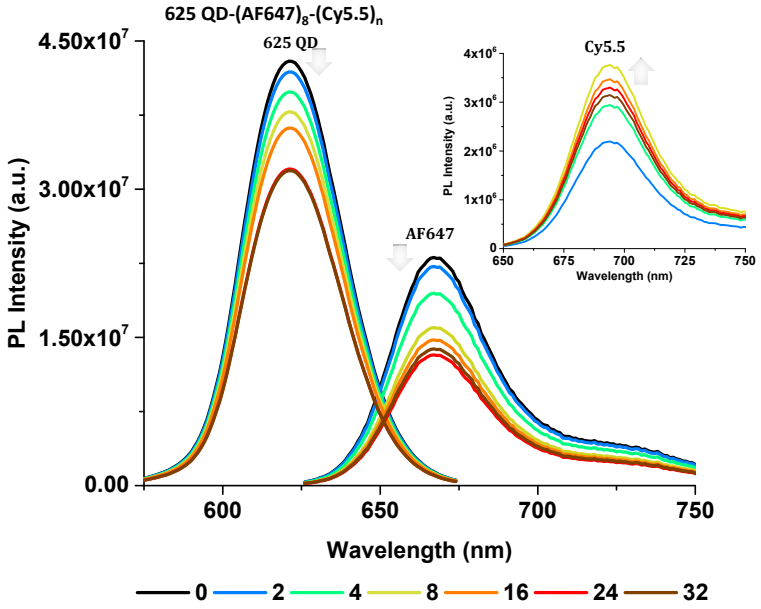
SI-Figure 1. Deconvoluted spectra of the $(Luc9)_8$-625 QD-$(AF647)_8$-$(AF700)_n$ with n = 0 to 32 constructs displaying contribution from individual components. With increasing ratio of the dye AF700, a consistent decrease in intensity of 625 QD and AF647 was observed. Intensity of the acceptor AF700 initially increased upto n = 8 followed by slight decrease at higher ratios (inset).



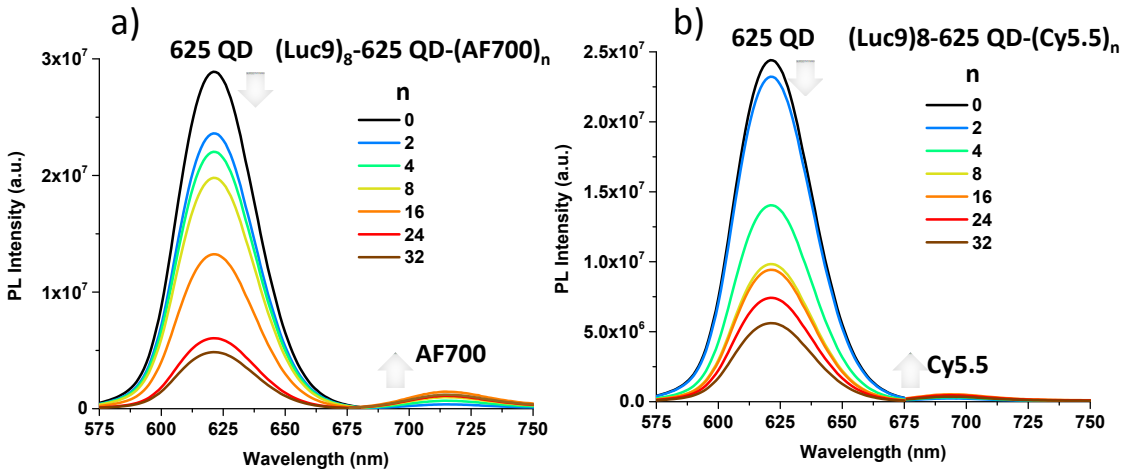
SI-Figure 2. Deconvoluted spectra of the $(Luc9)_8$-625 QD-$(AF647)_8$-$(AF700)_n$ with n = 0 to 32 constructs by directly exciting the QD at 475 nm. With increasing ratio of AF700, a slight decrease in QD and significant decrease in AF647 emission was observed. Emission intensity of the acceptor AF700 followed nearly the same trend as BRET from Luc (inset).



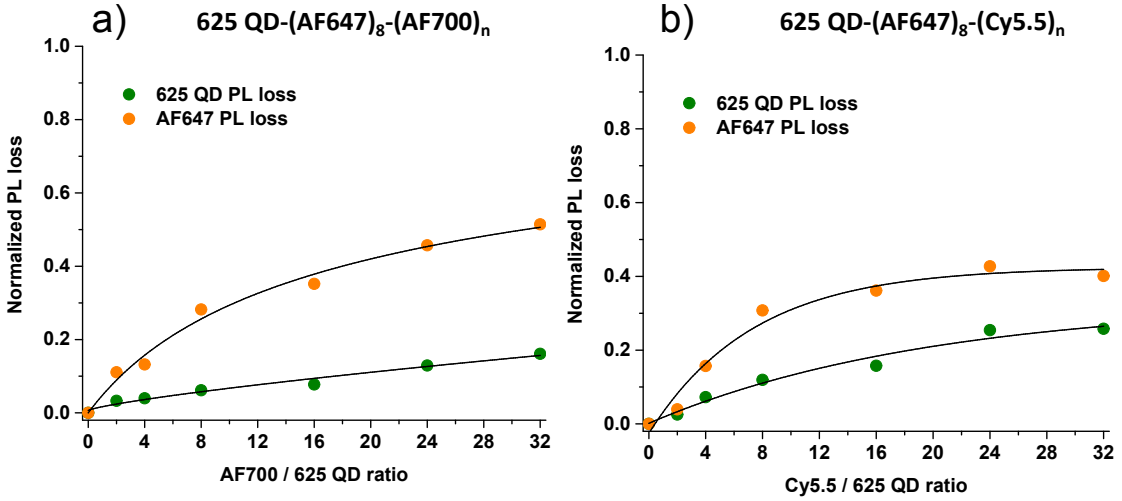
SI-Figure 3. Deconvoluted spectra of the $(Luc9)_8$-625 QD-$(AF647)_8$-$(Cy5.5)_n$ with n = 0 to 32 displaying contribution from individual components. With increasing ratio of the dye Cy5.5, a consistent decrease in intensity of QD and AF647 emission was observed. Intensity of the acceptor dye Cy5.5 initially increased upto n = 8 followed by a decrease at higher ratios (inset).



SI Figure 4. Deconvoluted spectra of the $(Luc9)_8$-625 QD-$(AF647)_8$-$(Cy5.5)_n$ with n = 0 to 32 constructs by directly exciting the QD at 475 nm. With increasing ratio of Cy5.5 slight decrease in QD and significant decrease in AF647 emission was observed. Emission intensity of the acceptor Cy5.5 followed nearly the same trend as BRET from Luc (inset).



SI Figure 5. Deconvoluted spectra of **(a)** $(Luc9)_8$-625 QD-$(AF700)_n$ (n = 0 to 32) and **(b)** $(Luc9)_8$-625 QD-$(Cy5.5)_n$ (n = 0 to 32). In the absence of an intermediatory dye AF647, sensitized emission from the final acceptor is much lower than the full constructs having eight AF647.



SI Figure 6. BRET ratios defined by donor emission loss (QD or AF647) of **(a)** $(Luc9)_8$-625 QD-$(AF647)_8$-$(AF700)_n$ (n =0 to 32) and **(b)** $(Luc)_8$-625 QD-$(AF647)_8$-$(Cy5.5)_n$ (n = 0 to 32).