

Supporting Information

Quantum Dot-MUC1 Aptamer Conjugate for Targeted Delivery of Protoporphyrin IX and Specific Photokilling of Cancer Cells through ROS Generation

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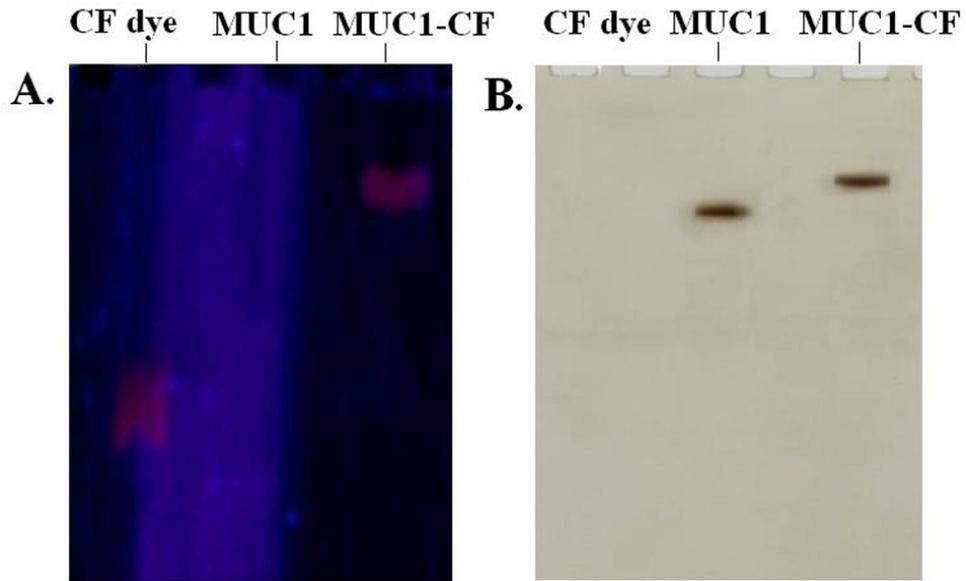


Figure S1. SDS-PAGE analysis of MUC1-CF dye conjugate before **A.** and after **B.** silver staining MUC1-CF conjugate shows retarded mobility as compared to free CF dye and free MUC1.

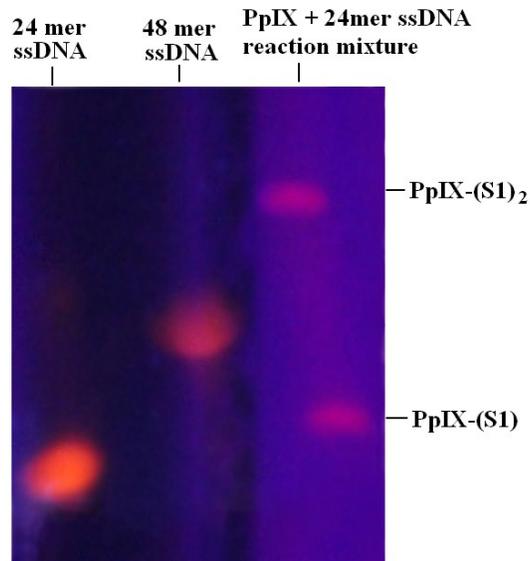


Figure S2. 30% denaturing PAGE showing formation of PpIX-(S1)₁ and PpIX-(S1)₂.

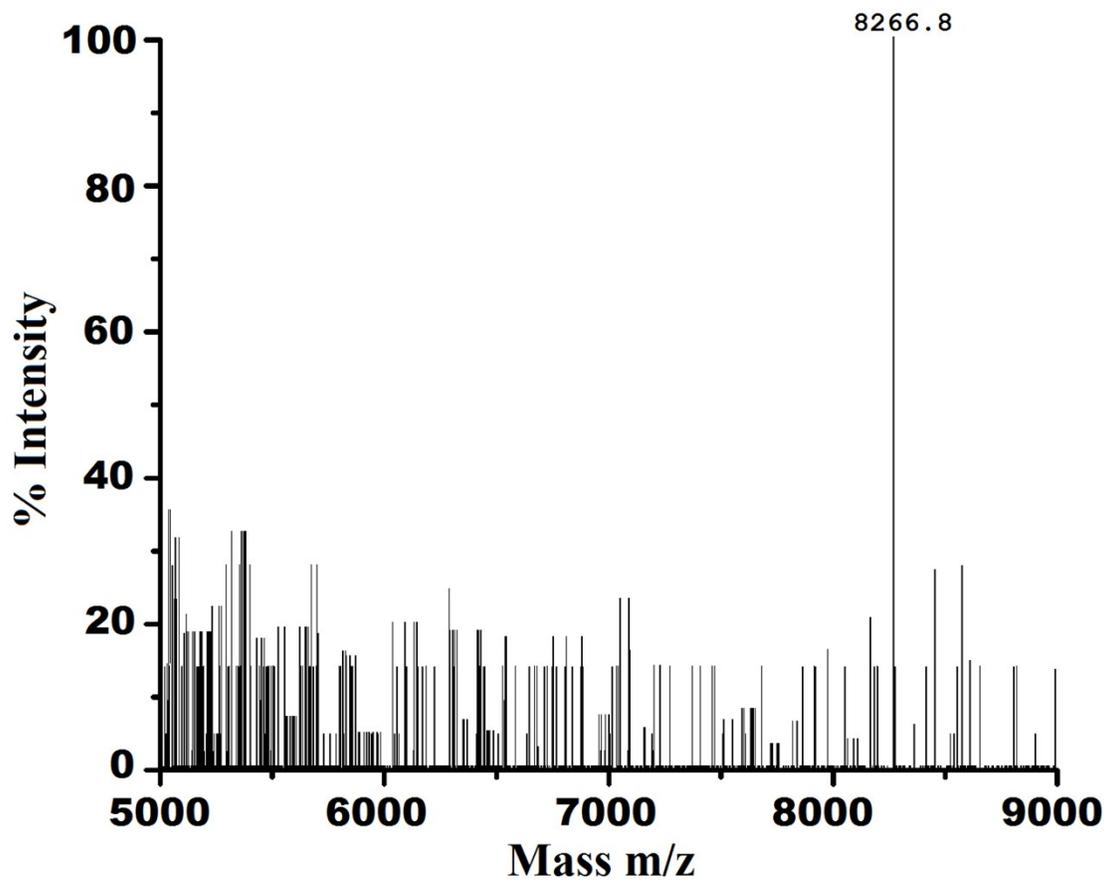


Figure S3. MALDI-TOF spectra of PpIX-ssDNA (S1) conjugate.

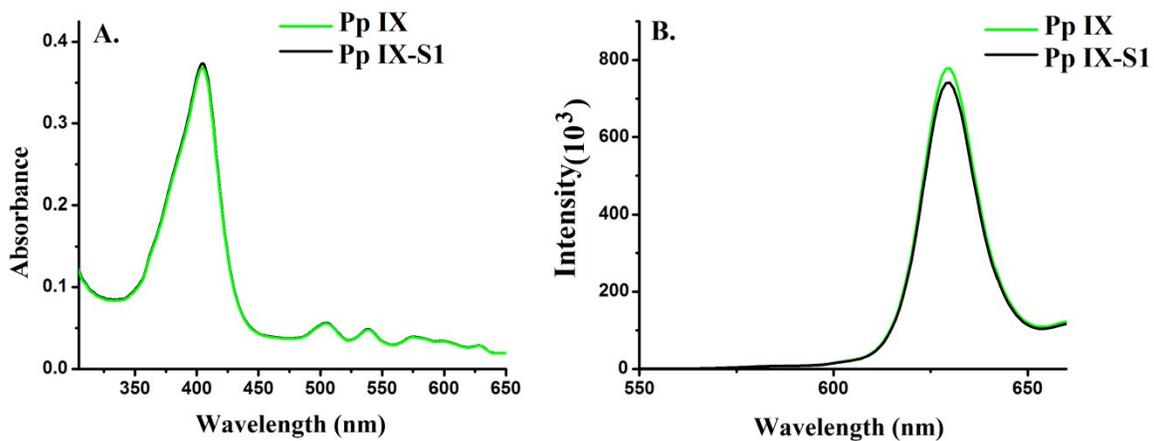


Figure S4. A. UV-Visible spectra B. Steady-State fluorescence spectra of PpIX and PpIX-DNA (S1).

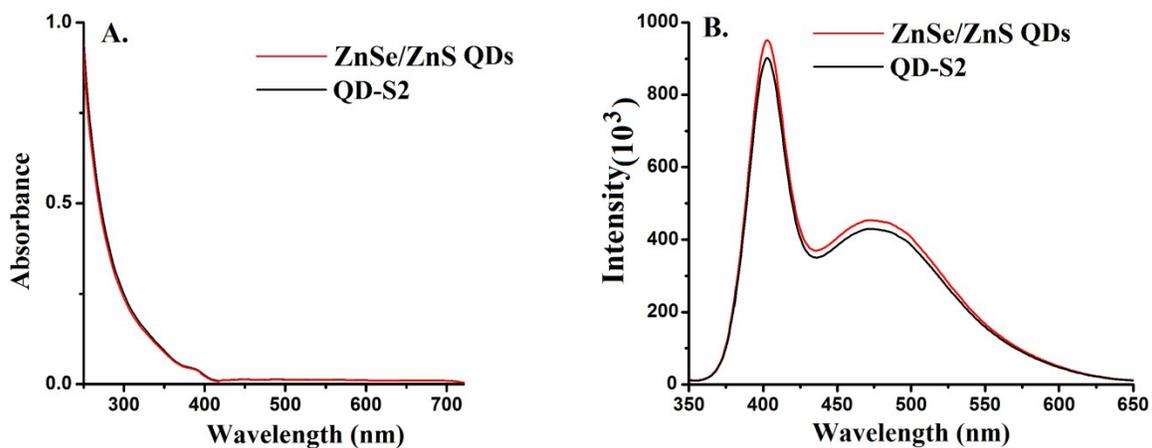


Figure S5. A. UV-Visible spectra **B.** Steady-State fluorescence spectra of QD and QD-apramer (S2).

Table S1: Absorption and emission wavelength of QD, PpIX and CF dye.

	Absorption	Emission
QD	~390 nm	400 nm
PpIX	402 nm	630 nm
CF dye	628 nm	653 nm

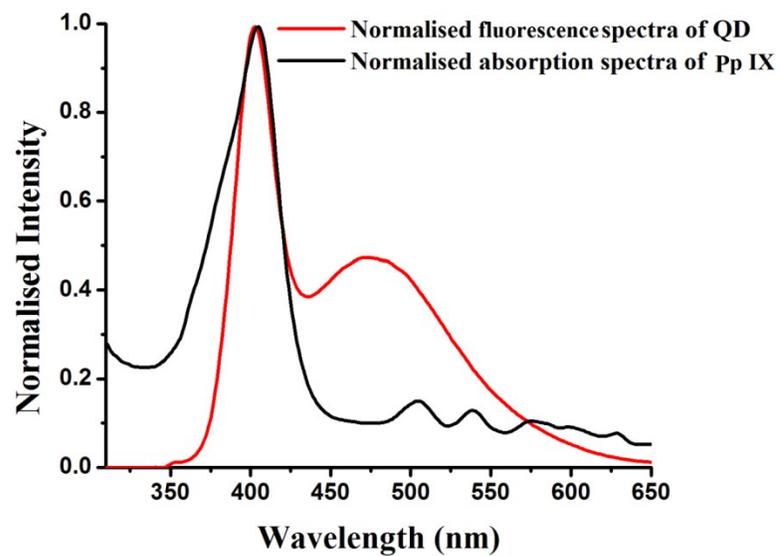


Figure S6. Normalised PpIX (acceptor) absorption spectra and QD (donor) fluorescence spectra.

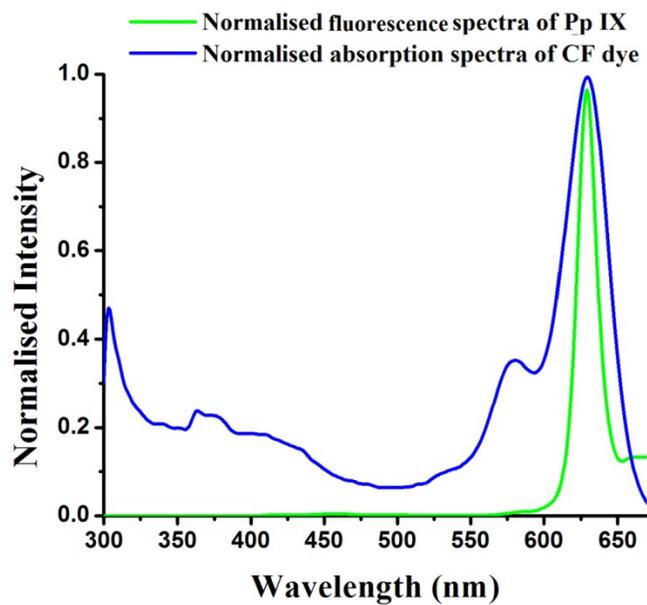


Figure S7. Normalised CF dye (acceptor) absorption spectra and PpIX (donor) fluorescence spectra.

Table S2: Comparison of FRET efficiency between QD and PpIX in PpIX-QD-S2 and QD-S2-S1-PpIX assembly.

	Reactant ratio	Product ratio	FRET Efficiency %		
			Steady State	Lifetime Measurement	Average
PpIX-QD-S2	1:4	1:3.2	78	81	80.5
QD-S2-S1-PpIX	1:4	1:2.9	70	72	71

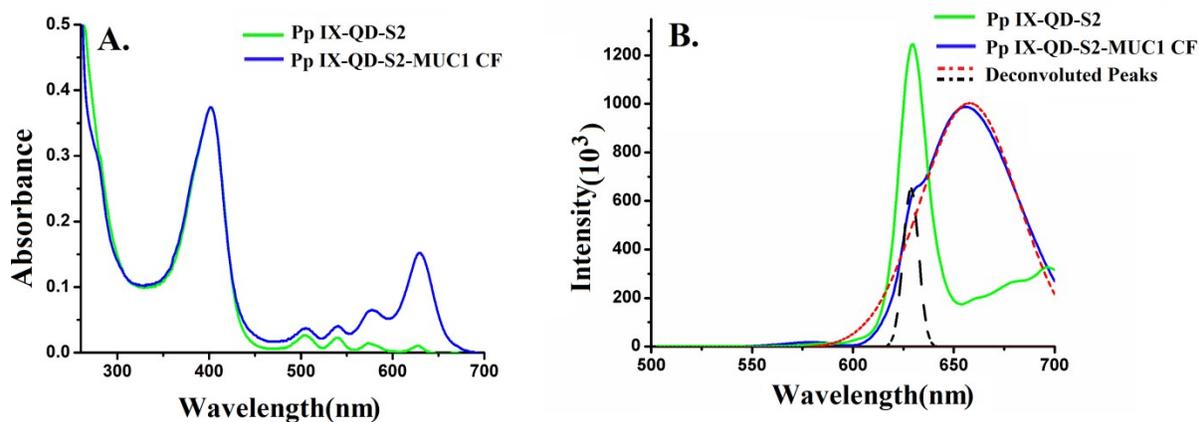


Figure S8. FRET analysis of PpIX-CF dye **A.** UV-visible absorption spectra and **B.** Fluorescence spectra ($\lambda_{\text{ex}} = 402$ nm) of PpIX-QD-S2 in absence and presence of MUC1-CF dye.

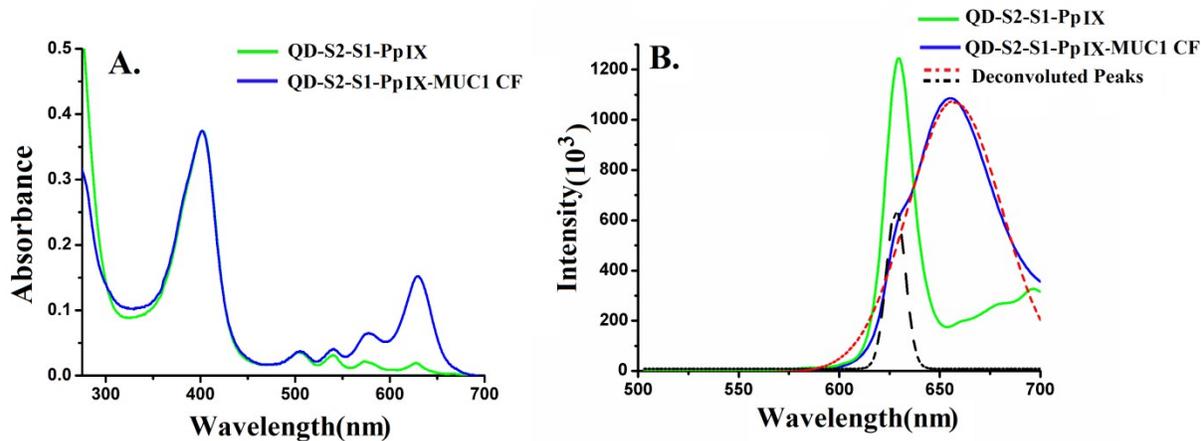


Figure S9. FRET analysis of PpIX-CF dye **A.** UV-visible absorption and **B.** Fluorescence spectra ($\lambda_{\text{ex}} = 402 \text{ nm}$) of QD-S2-S1-PpIX in absence and presence of MUC1-CF dye.

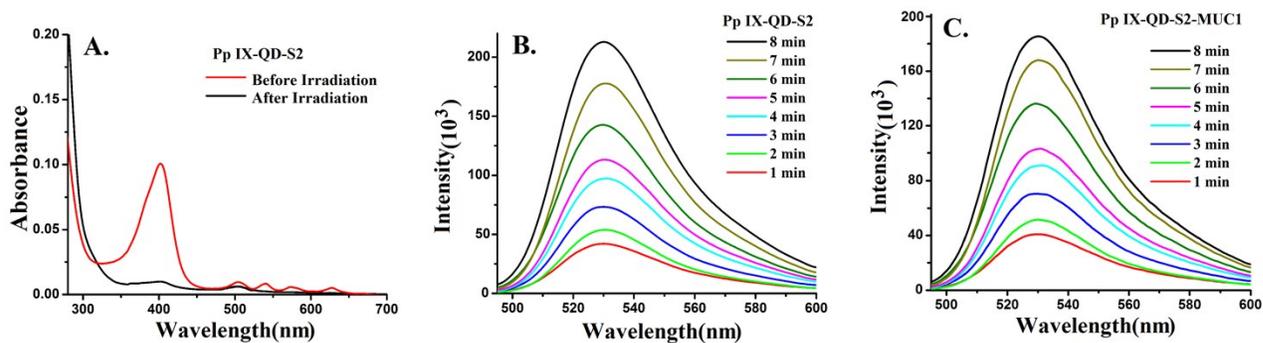


Figure S10. **A.** UV-Visible spectra of PpIX-QD-S2 direct conjugates with DHR 123 before and after irradiation **B.** Fluorescence spectra of Rhodamine 123 at $\lambda_{\text{ex}} = 485 \text{ nm}$ in PpIX-QD-S2 direct conjugates **C.** Fluorescence spectra of Rhodamine 123 at $\lambda_{\text{ex}} = 485 \text{ nm}$ in PpIX-QD-S2-MUC1 direct conjugates on ROS generation.

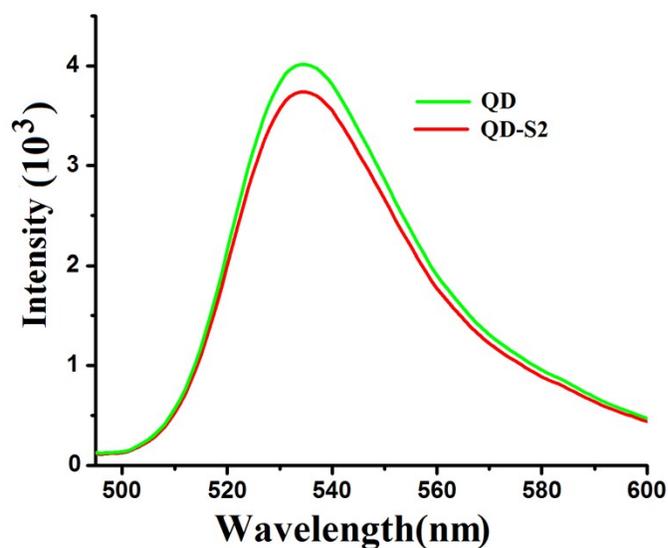


Figure S11. Fluorescence spectra of Rhodamine 123 at $\lambda_{ex} = 485$ nm in QD and QD-S2 conjugates on 8 min irradiation indicates ROS generation.

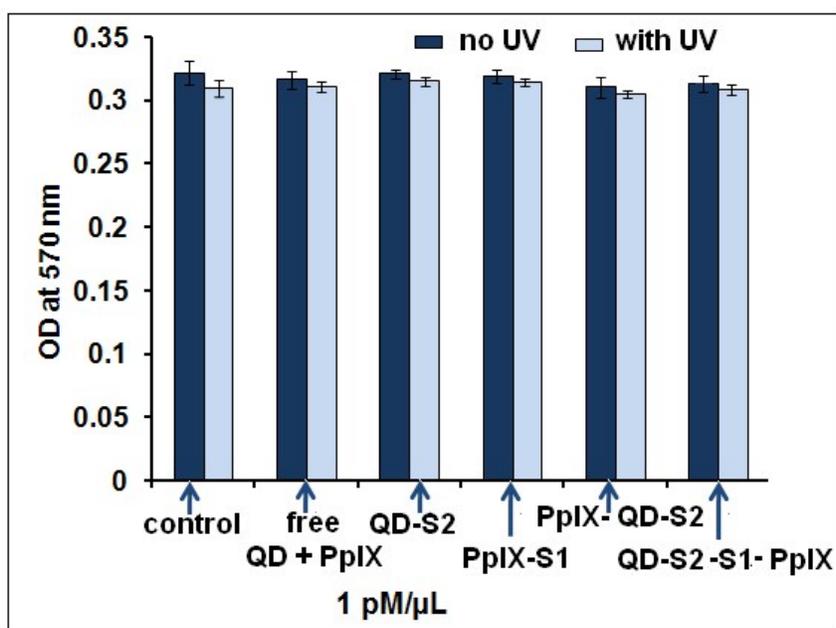


Figure S12. Viability of RAW cells treated with PpIX-QD-S2 and QD-S2-S1-PpIX with and without light activation by UV at 24 h post exposure. Control (PBS alone) and treatments with nanoassemblies/components and their concentrations are indicated on X axis. Absorbance readings were presented as $OD_{570} \pm SD$ on Y axis.