

Supplementary Material

Formation of Multicolor Nanogels Based on Cationic Polyfluorenes and Poly(methyl vinyl ether-alt-maleic monoethyl ester): Potential Use as pH-responsive Fluorescent Drug Carriers

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Table S1. Effect of alkalisation and subsequent acidification on the hydrodynamic diameter (d) and polydispersity index (PDI) of green and red-emitting NPs.

	medium	d \pm sd (nm)	PDI
Green NPs	water	172.0 \pm 4.2	0.12 \pm 0.03
	pH 7	428.1 \pm 28.6	0.25 \pm 0.02
	pH 4	206.4 \pm 6.0	0.13 \pm 0.03
Red NPs	water	194.6 \pm 4.0	0.13 \pm 0.02
	pH 7	708.3 \pm 11.4	0.27 \pm 0.07
	pH 4	245.1 \pm 8.5	0.18 \pm 0.08

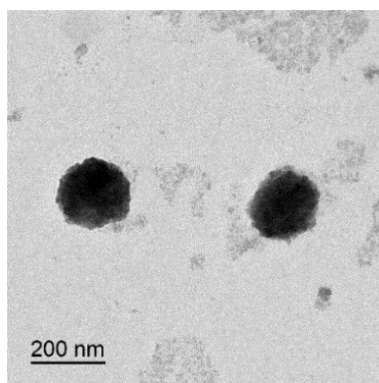


Figure S1. Representative images of transmission electron microscopy (TEM) of PMVEMA-Es NPs

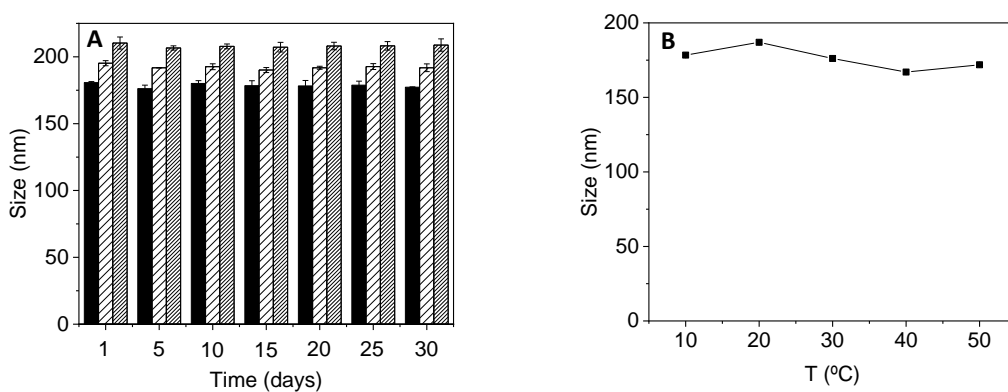


Figure S2. (A) Bar diagrams showing the hydrodynamic diameters of PMVEMA-Es NPs (0.03 M) as a function of time (1-30 days), in MilliQ water (black), glucose 0.2 M (striped) and saccharose 0.2 M (full striped). Note that the slight increase in size observed after addition may be related to the change in viscosity and refractive index of the medium, rather than a real increase in the size of the nanoparticles. (B) Effect of temperature (10-50°C) on the hydrodynamic diameter of NPs (0.03 M) in MilliQ water.

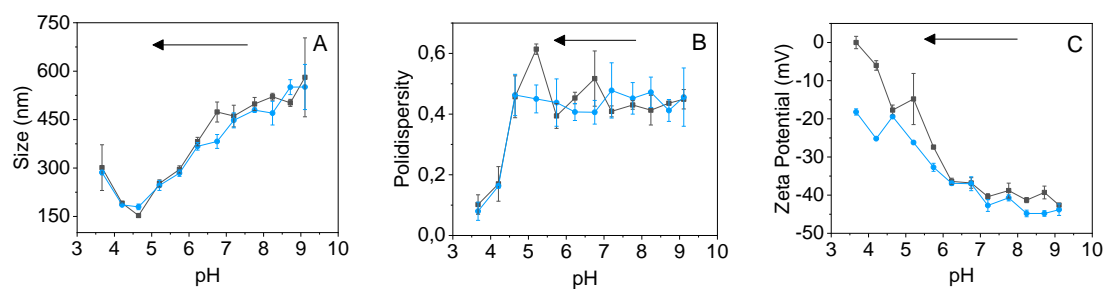


Figure S3. Reversible swelling–shrinking behaviour of PMEVEMA-Es NPs in absence (black) and in presence (blue) of HTMA-PFP, as the pH decreased from 9 to 3.

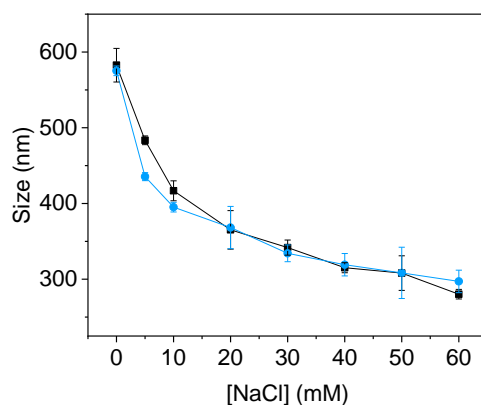


Figure S4. Effect of NaCl, up to 60 mM, on the hydrodynamic diameter of PMVEMA-Es NPs (0.03 M) in absence (black) and in presence (blue) of HTMA-PFP (1.5 μ M).

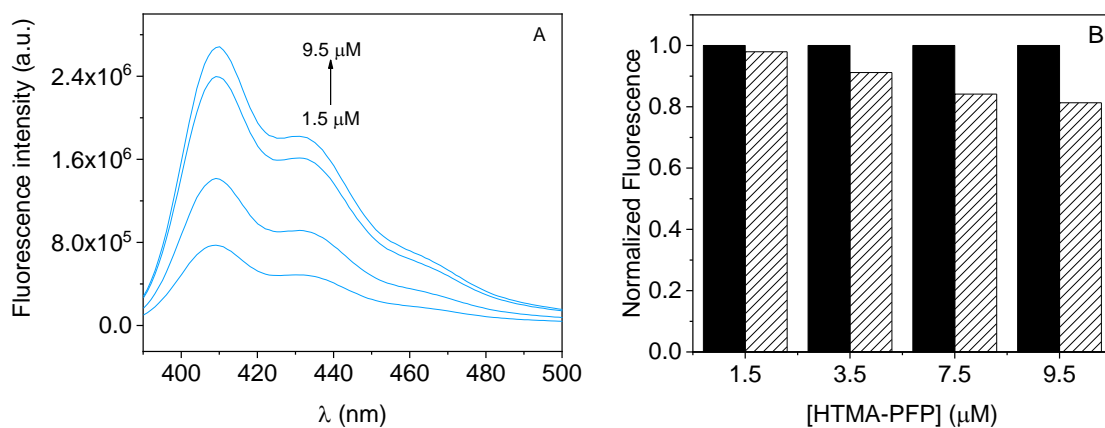


Figure S5. (A) Fluorescence emission spectra of HTMA-PFP in PMVEMA-Es NPs (0.03 M) at different concentrations of polyfluorene (1.5, 3.5, 7.5 and 9.5 μ M). (B) Normalized fluorescence intensity of HTMA-PFP in PMVEMA-Es NPs (0.03 M) at different concentrations (1.5, 3.5, 7.5 and 9.5 μ M) recorded the first (black bar) and the fifth day (strip bar) after preparation.

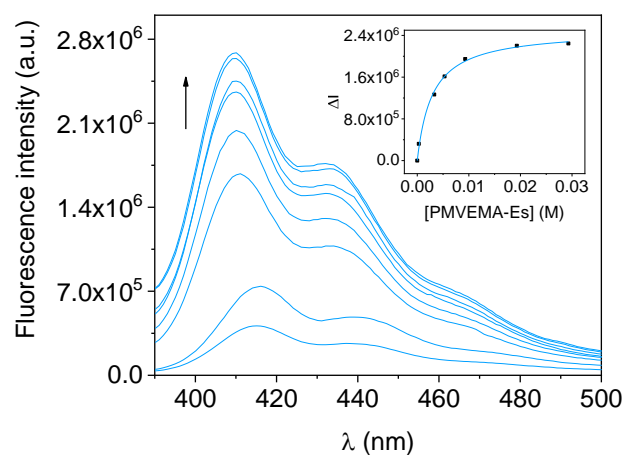


Figure S6. Fluorescence emission spectra of HTMA-PFP (1.5 μM) in MilliQ water with increasing concentrations of NPs (0-0.03 M). Inset: Changes in the fluorescence intensity of the spectrum as a function of PMVEMA-Es concentration.

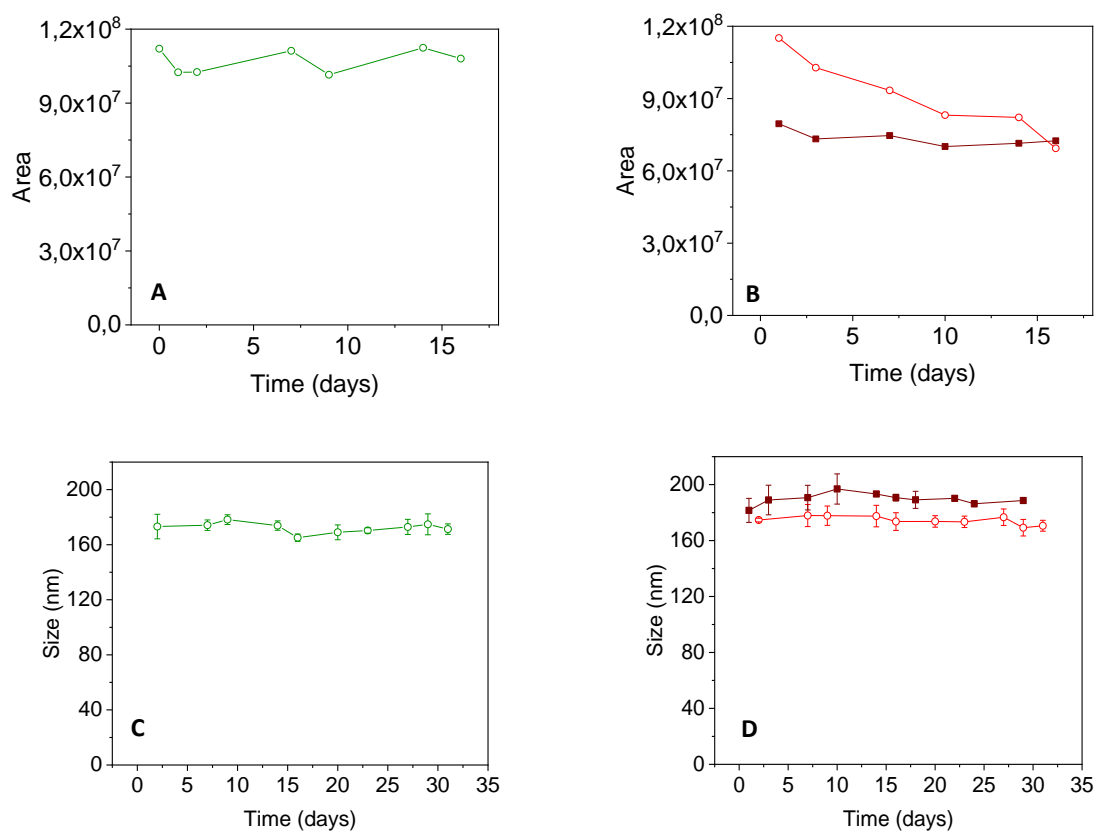


Figure S7. Effect of time storage on the area of the fluorescence emission spectrum (A-B) and hydrodynamic diameter (C-D) of green (A, C) and red NPs (B, D). Open circles and filled squares indicate the addition of polyelectrolyte after and during the preparation of PMVEMA-Es NPs, respectively.

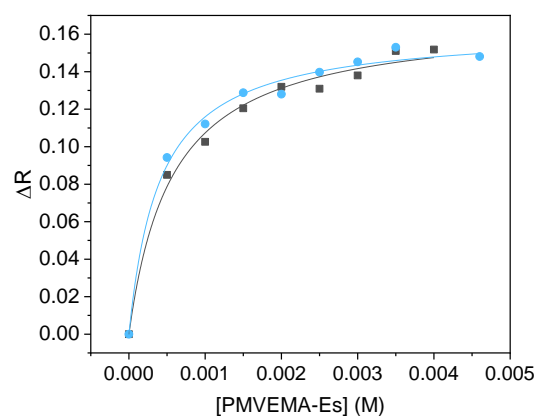


Figure S8. Changes in the ratio of emission peaks, $\Delta R = (I_{590}/I_{557}) - (I_{590}/I_{557})_{\text{water}}$, of DOX in water at increasing amounts of NPs in presence (blue circles) and in absence (black squares) of HTMA-PFP.

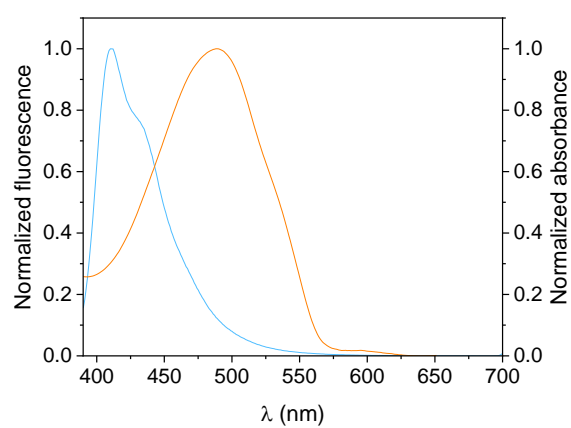


Figure S9. Overlap between the fluorescence emission spectrum of HTMA-PFP (blue) and the absorption spectrum of DOX (orange) in MilliQ water.

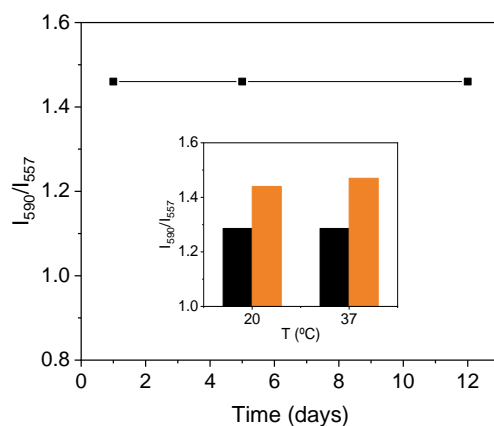


Figure S10. Effect of storage time on the ratio of the intensities of DOX emission peaks, $R=I_{590}/I_{557}$, inserted in the blue-emitting NPs. Inset: Effect of temperature on R , for DOX inserted in fluorescent NPs (orange bars) or free in water (black bars). $\lambda_{exc}=380$ nm.

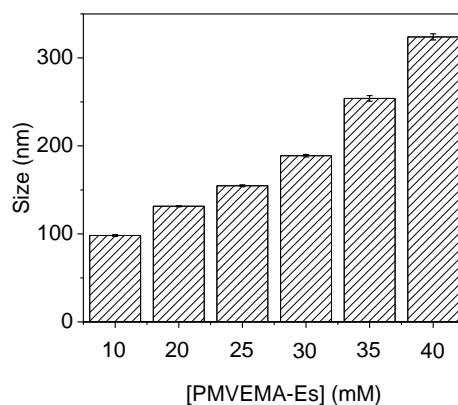


Figure S11. Hydrodynamic diameters, measured by DLS, of NPs prepared in MilliQ water, as a function of PMVEMA-Es concentration.