Electronic Supporting Information

Enhanced uptake of nanoparticle drug carriers via a thermoresponsive shell enhances cytotoxicity in a cancer cell line

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Table S1 Polymers with the initial feed amounts and molar ratios of the comonomers.

Copolymer products	*Initial feed amounts*				*[PPGMA]:[PEGMEMA] initial feed molar ratios*
	PPGMA		PEGMEMA		
	g	mmol	g	mmol	
P1	2.11	5.63	0.89	1.87	3 : 1
P2	1.88	5.00	1.19	2.50	2 : 1
P3	1.41	3.75	1.78	3.75	1 : 1

Table S2 Characterisation of R6G-loaded nanoparticles including drug loading, encapsulation efficiency and NP recovery.

Theoretical drug loading (% w/w)	*Practical drug loading (% w/w) mean ± SD*	*Encapsulation efficiency (%) mean ± SD*	*NP recovery (yield) (%) mean ± SD*
0.1	0.05 ± 0.004	48.8 ± 4.0	93.7 ± 1.4
0.25	0.11 ± 0.01	44.8 ± 2.3	96.0 ± 1.1
0.4	0.13 ± 0.01	32.2 ± 1.7	95.6 ± 0.8

Table S3 Characterisation of blank and PTX-loaded nanoparticles including particle sizes, zeta potentials, drug loading, encapsulation efficiency and NP recovery.

Polymer (mg)	**50**				**100**				
Initial amount of PTX (mg)	**0.0**	**0.25**	**0.5**	**1.0**	**0.0**	**0.25**	**0.5**	**1.0[a]**	**1.0[b]**
Particle size (R_h) ± S.D (nm)	28.7 ± 10.8	32.7 ± 19.1	29.9 ± 12.7	31.8 ± 13.7	31.2 ± 12.8	29.4 ± 14.0	33.4 ± 16.6	29.9 ± 11.7	31.5 ± 11.7
Zeta potential ± S.D (mV)	-2.6 ± 2.0	-2.6 ± 1.9	-2.5 ± 1.9	-1.6 ± 1.9	-0.2 ± 2.0	0.6 ± 2.0	-1.1± 2.1	1.0 ± 2.0	--
Theoretical drug loading (% w/w)	0.0	0.5	1.0	2.0	0.0	0.25	0.5	1.0	1.0
Practical drug loading (% w/w) mean ± SD	0.0	0.48 ± 0.02	0.58 ± 0.00	0.24 ± 0.01	0.0	0.23 ± 0.00	0.40 ± 0.01	0.50 ± 0.01	0.76 ± 0.01
Encapsulation efficiency (%) mean ± SD	-	95.0 ± 4.7	57.8 ± 0.2	12.0 ± 0.3	-	92.0 ± 1.7	80.6 ± 2.5	50.3 ± 1.2	76.2 ± 1.2
NP recovery (yield) (%) mean ± SD	96.0	97.3 ± 0.2	93.9 ± 0.8	42.5 ± 3.7	78.0	95.2 ± 0.6	90.0 ± 2.8	63.9 ± 2.3	80.4 ± 0.03

Note – [a] = conventional IPD method, [b] = modified IPD method

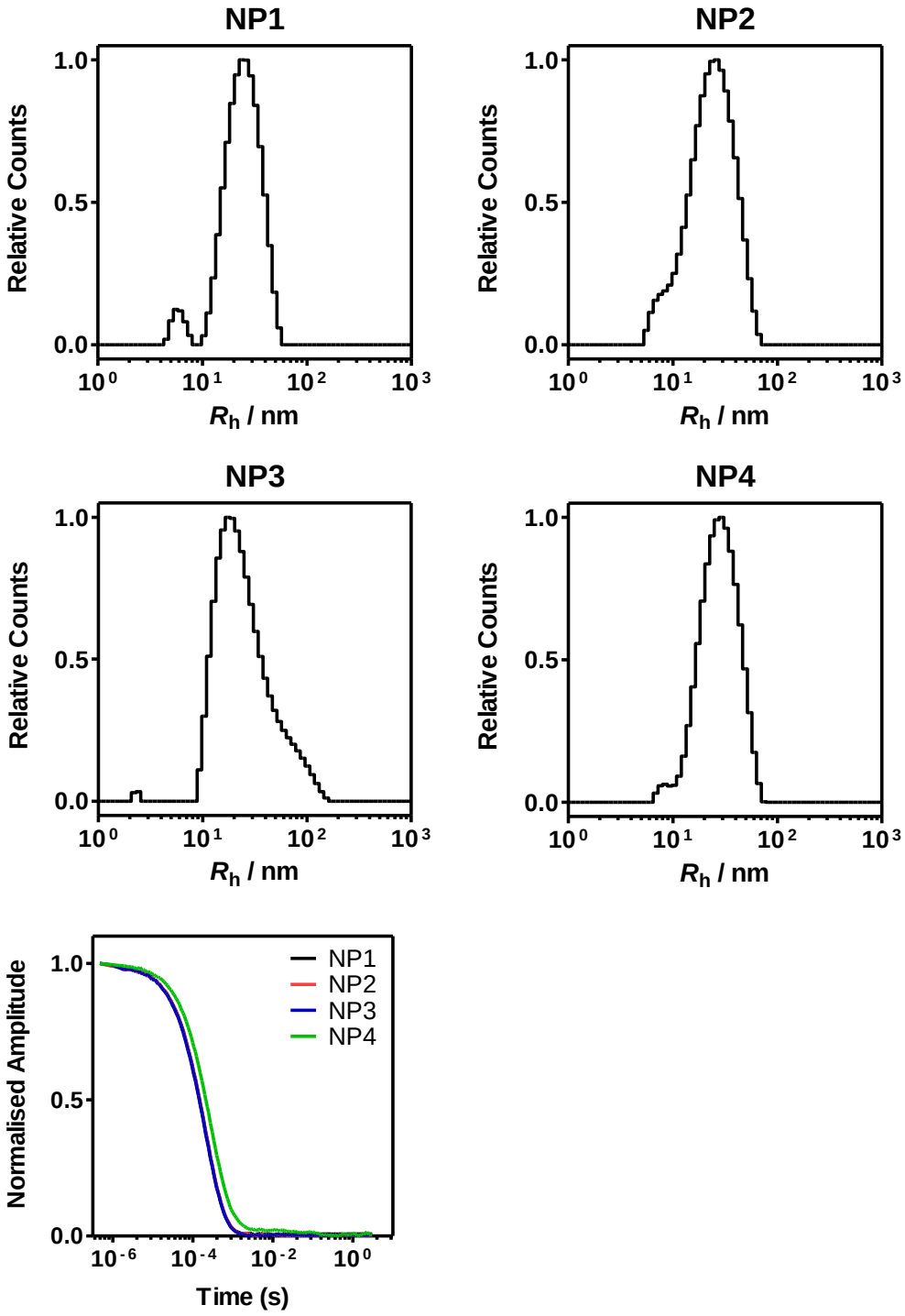

Figure S1 – Particle size distributions for NP1-4 as determined by Dynamic Light Scattering (DLS) and corresponding correlation curves

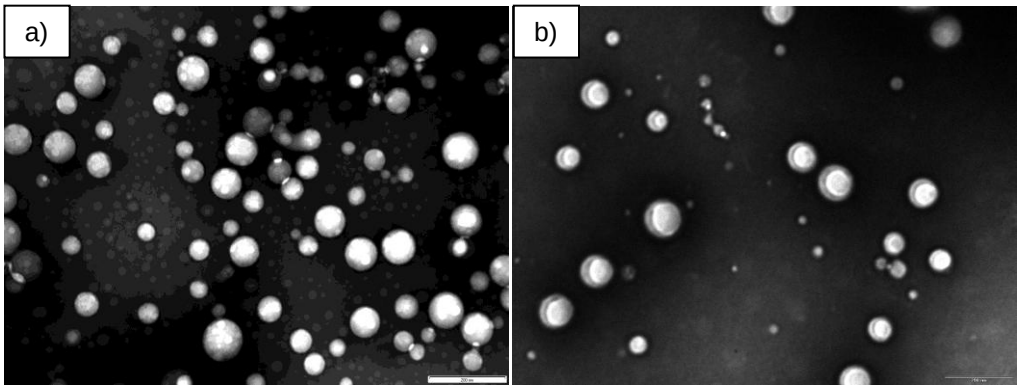

Figure S2 TEM micrographs of PTX- loaded NPs using 1 mg of PTX and a) 50 mg polymer; b) 100 mg polymer (Scale bar: 200 nm).

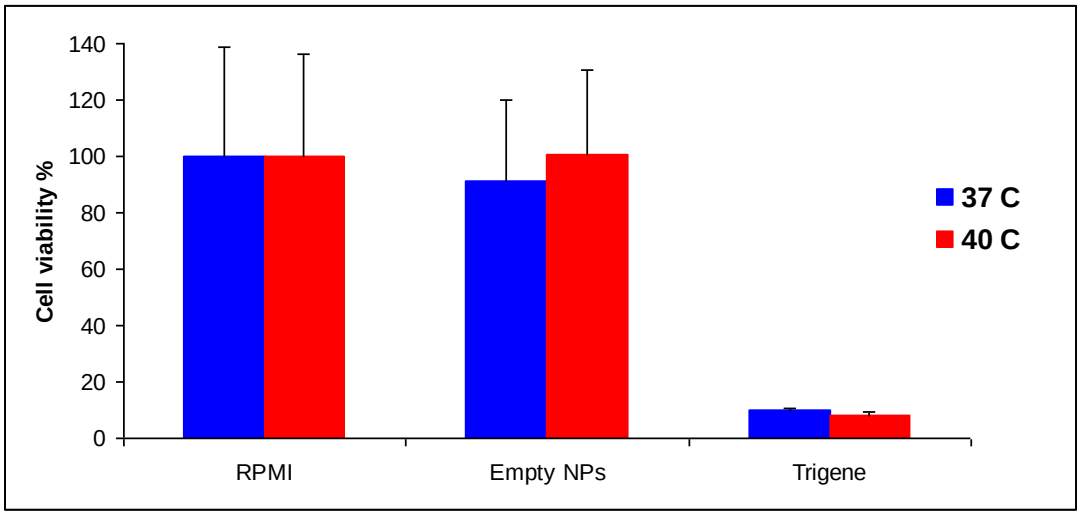

Figure S3 Cytotoxicity of empty NPs compared to Trigene (positive control) and RPMI media (negative control). Cell viability levels for MCF7 cells are represented as a percentage with respect to the level obtained for the negative control.

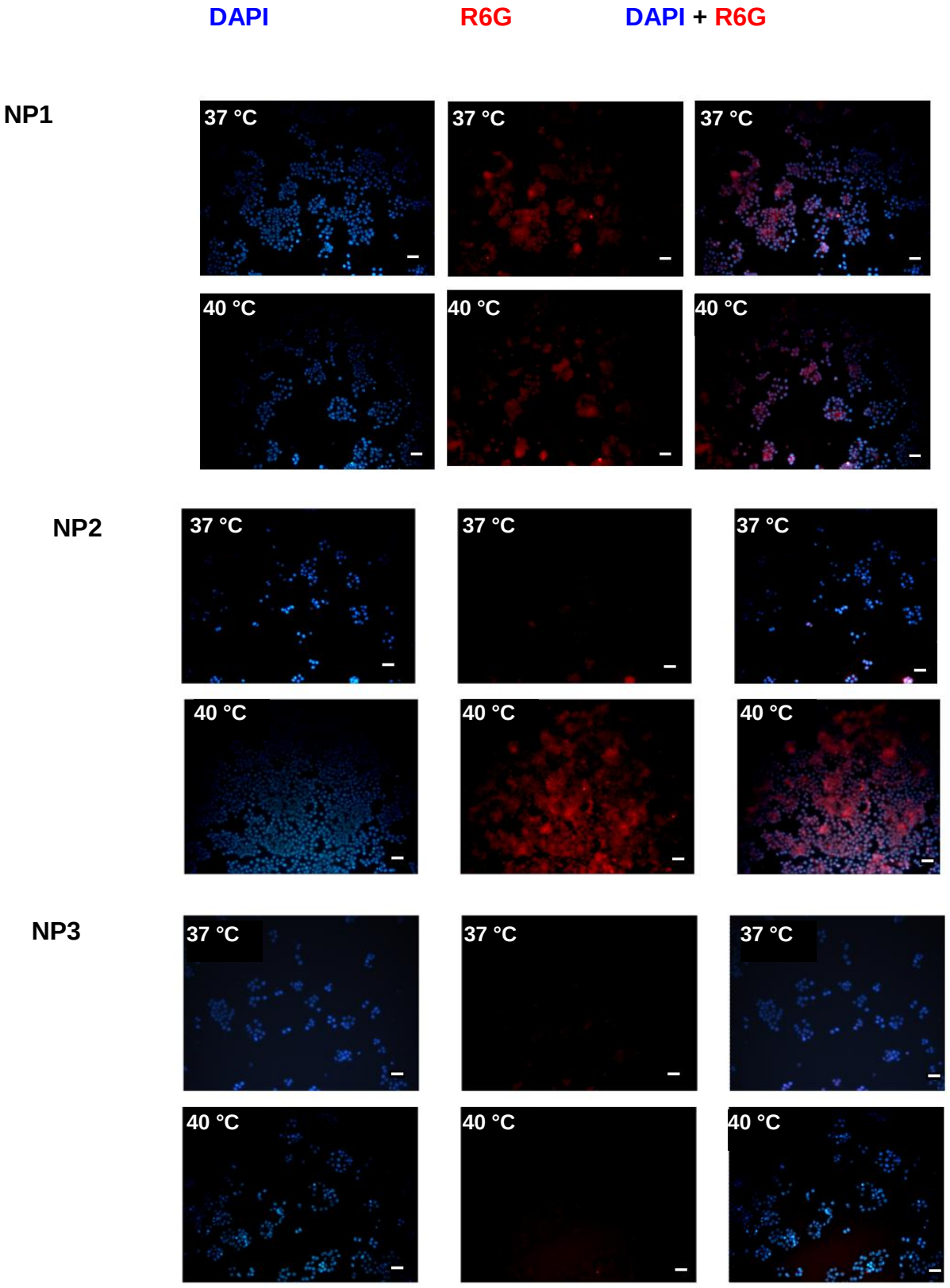

Figure S4 Fluorescence microscopy of MCF7 breast cancer cells after incubation with R6G-loaded NPs at 37 °C and 40 °C. Micrographs obtained under DAPI filters are on the left-hand side of the image, micrographs obtained under rhodamine filters are on the middle of the image, and combined images obtained under DAPI and rhodamine filters are shown on the right-hand side.

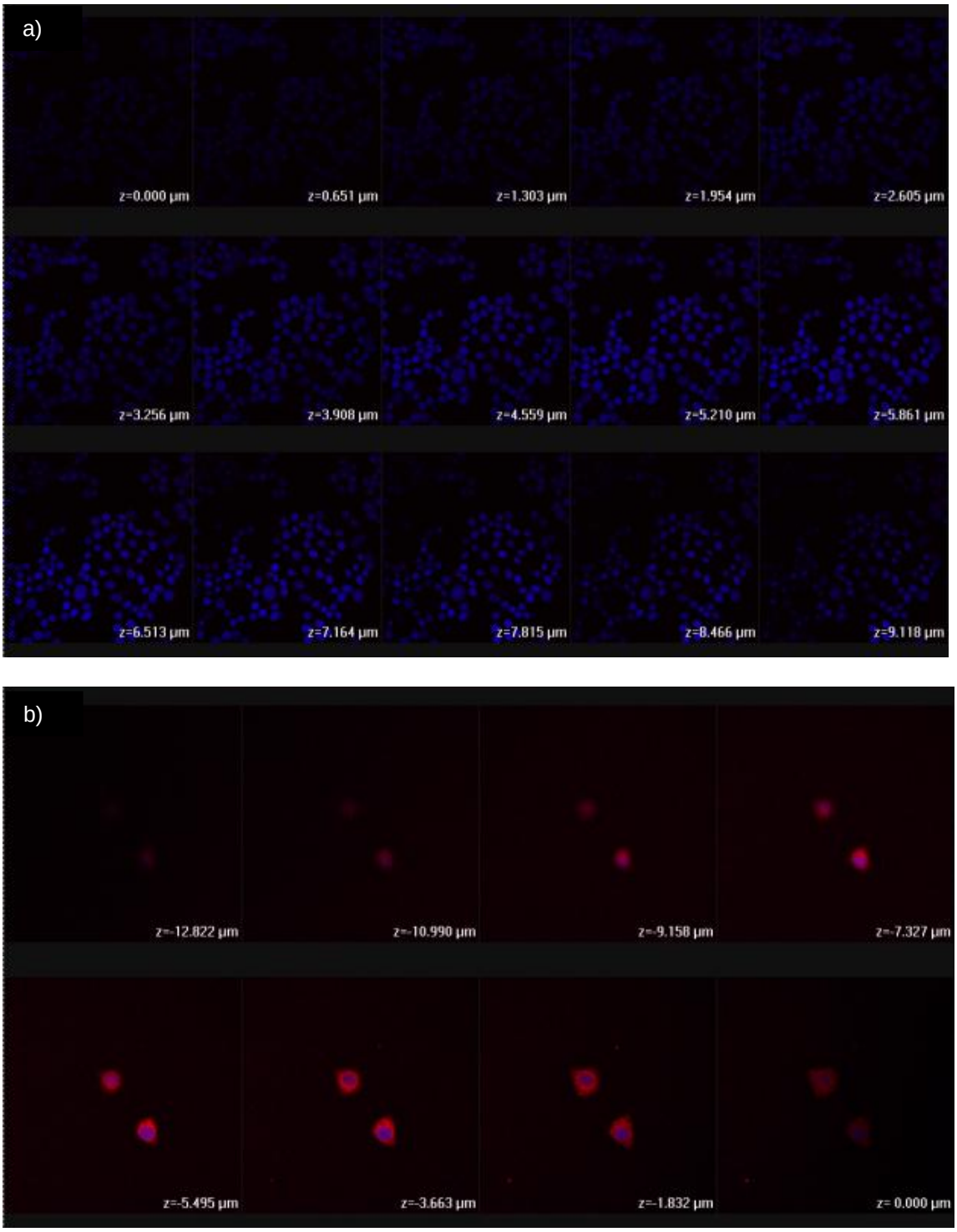

Figure S5 Confocal microscopy images of MCF7 breast cancer cells after incubation with R6G-loaded NP2 at 37 °C (a) and 40 °C (b). Combined images obtained under DAPI and rhodamine filters at different confocal depths (z sections in µm)
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