

Supporting information

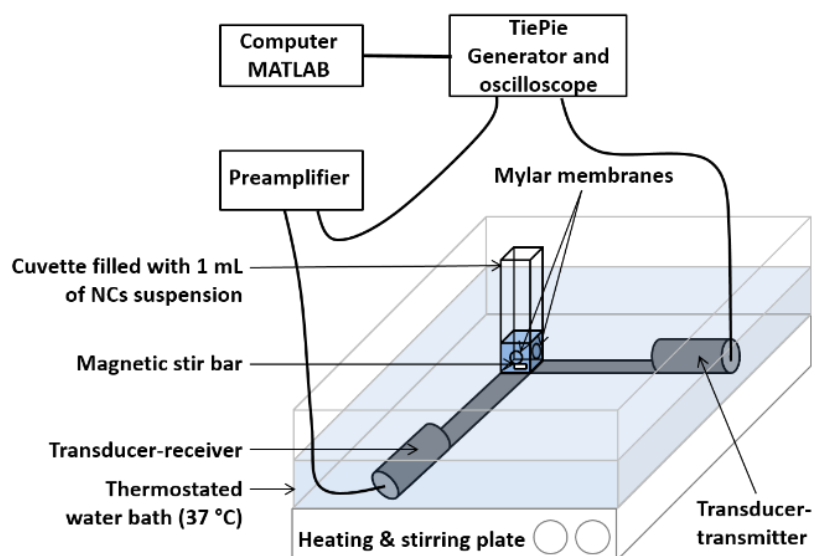


Figure S1 : Simplified scheme of the experimental set up for *in vitro* ultrasound measurements

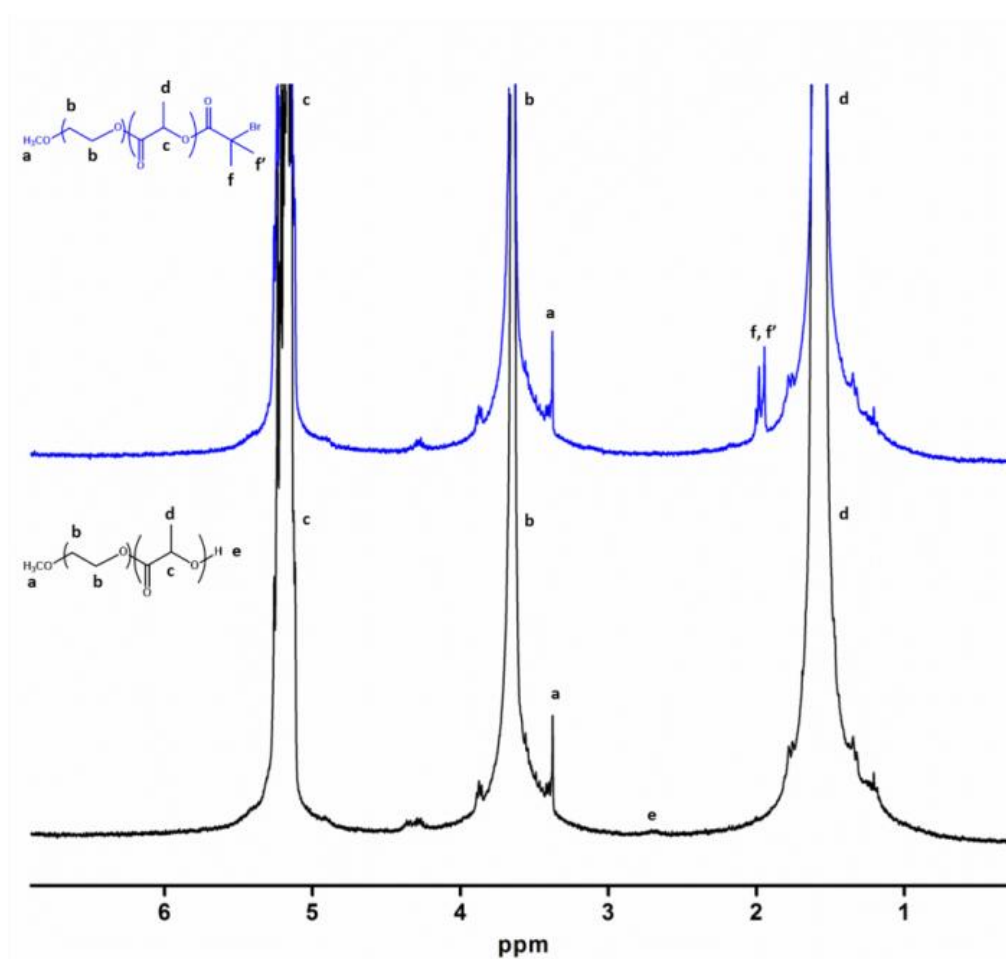


Figure S2: ¹H NMR spectra of PEG-PLA and PEG-PLA-Br macroinitiator in CDCl₃ (normalized by PEG peak at 3.64 ppm).

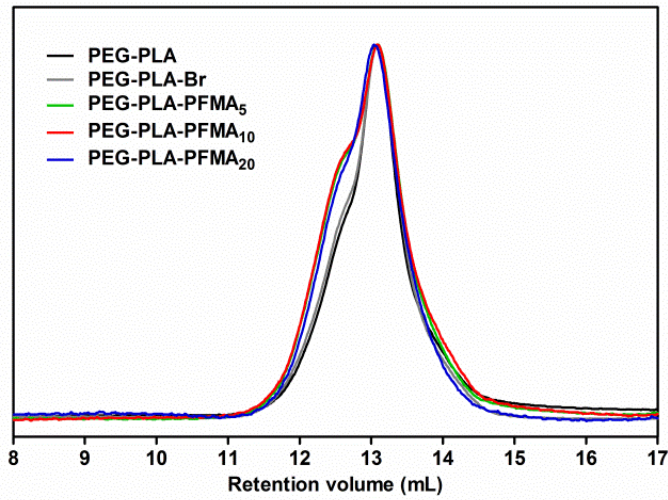


Figure S3: SEC chromatograms of all synthesized polymers in chloroform.

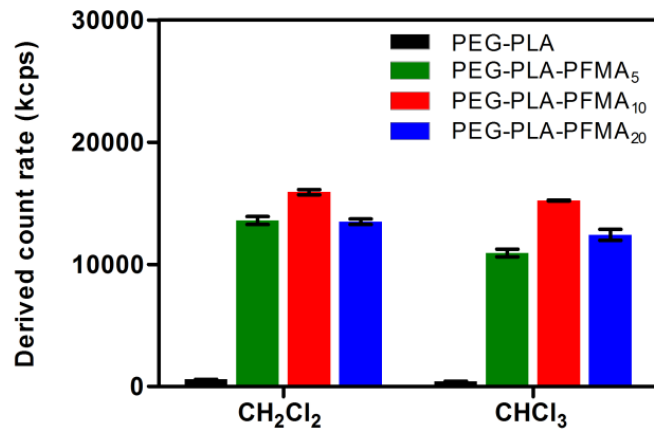


Figure S4: DLS of polymers at 25 mg/mL in methylene chloride and chloroform, showing an increase of scattered intensity with fluorinated triblock polymers.

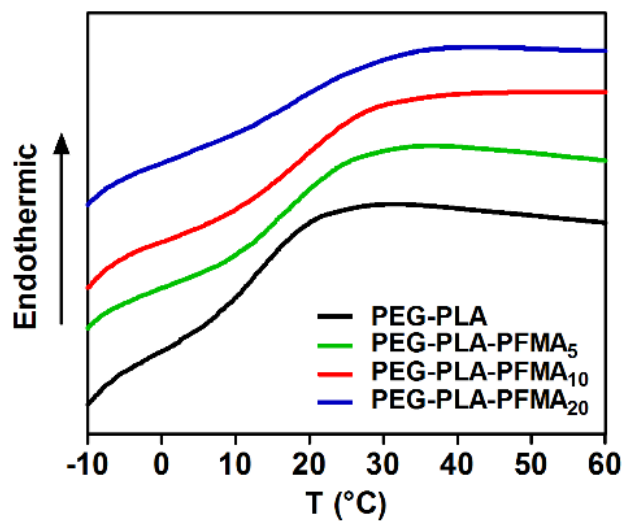


Figure S5 : DSC thermograms of the synthesized polymers

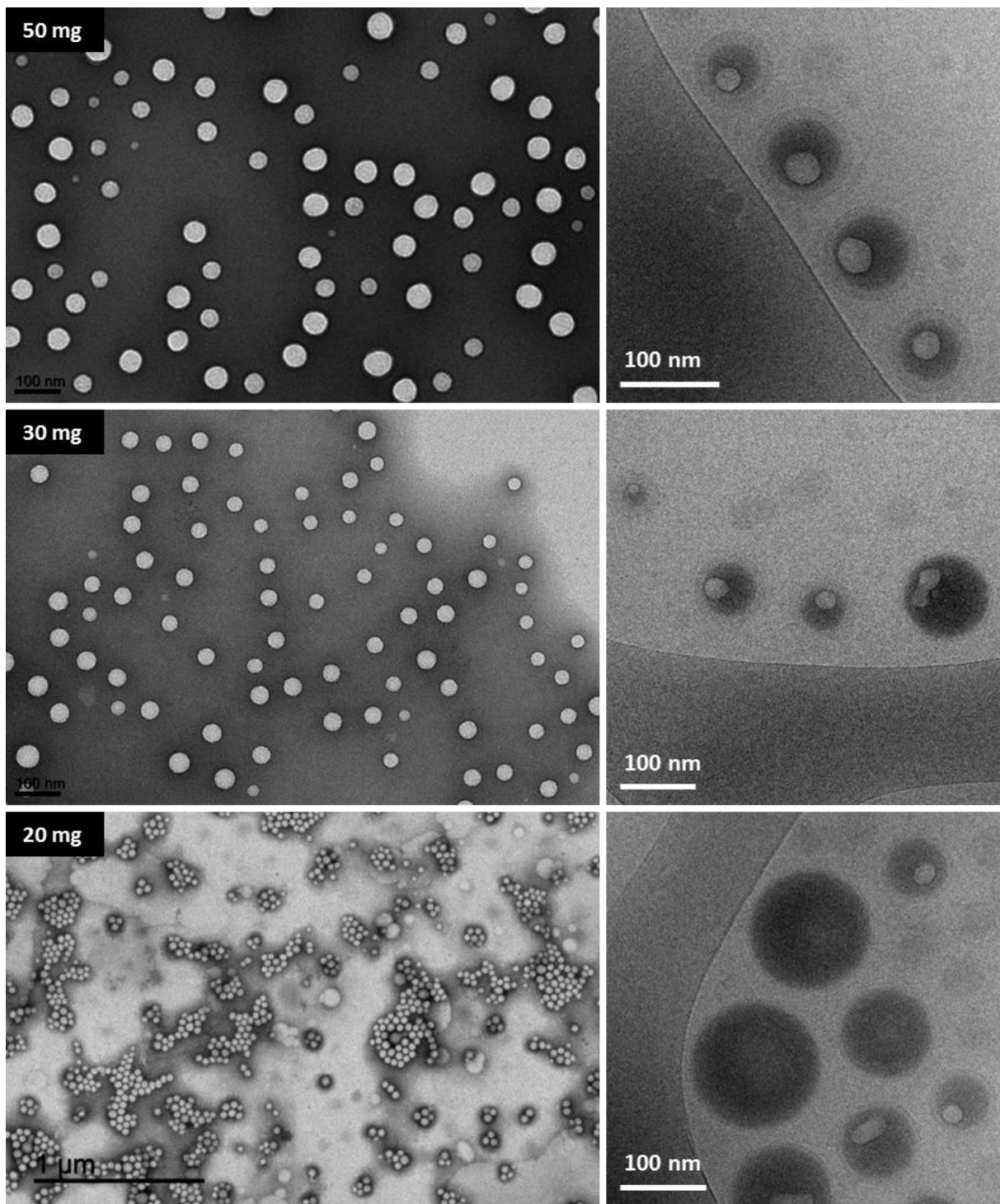


Figure S6: Additional TEM (left) and cryo-TEM (right) images of PEG-PLA NCs

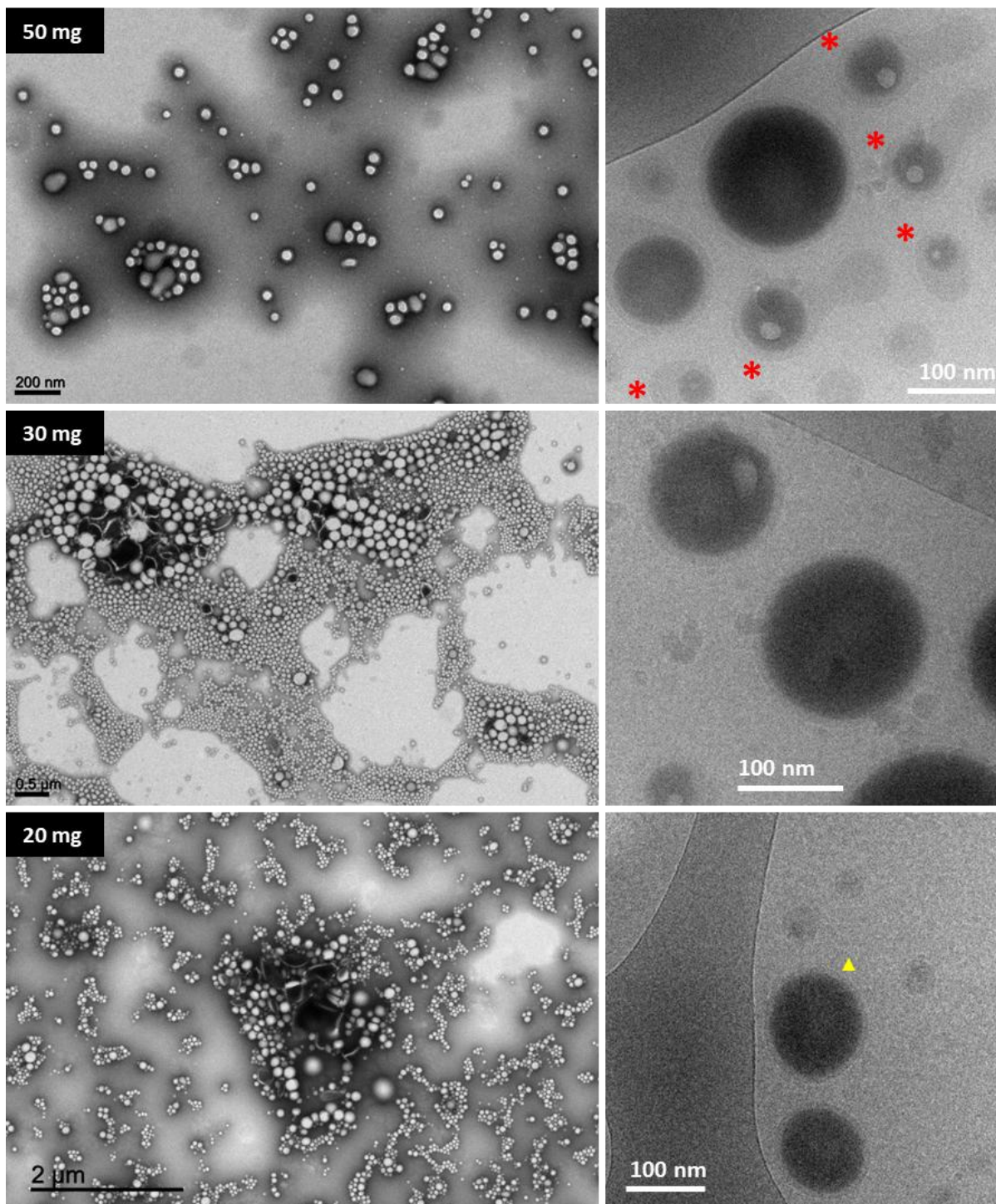


Figure S7: Additional TEM (left) and cryo-TEM (right) images of PEG-PLA-PFMA₅ NCs. Red stars show elongated NCs with a non-centered spherical PFOB core at high polymer amounts. Yellow triangles show ellipsoidal NCs with a single non-spherical PFOB core and a shell thickness homogeneous within the same capsule

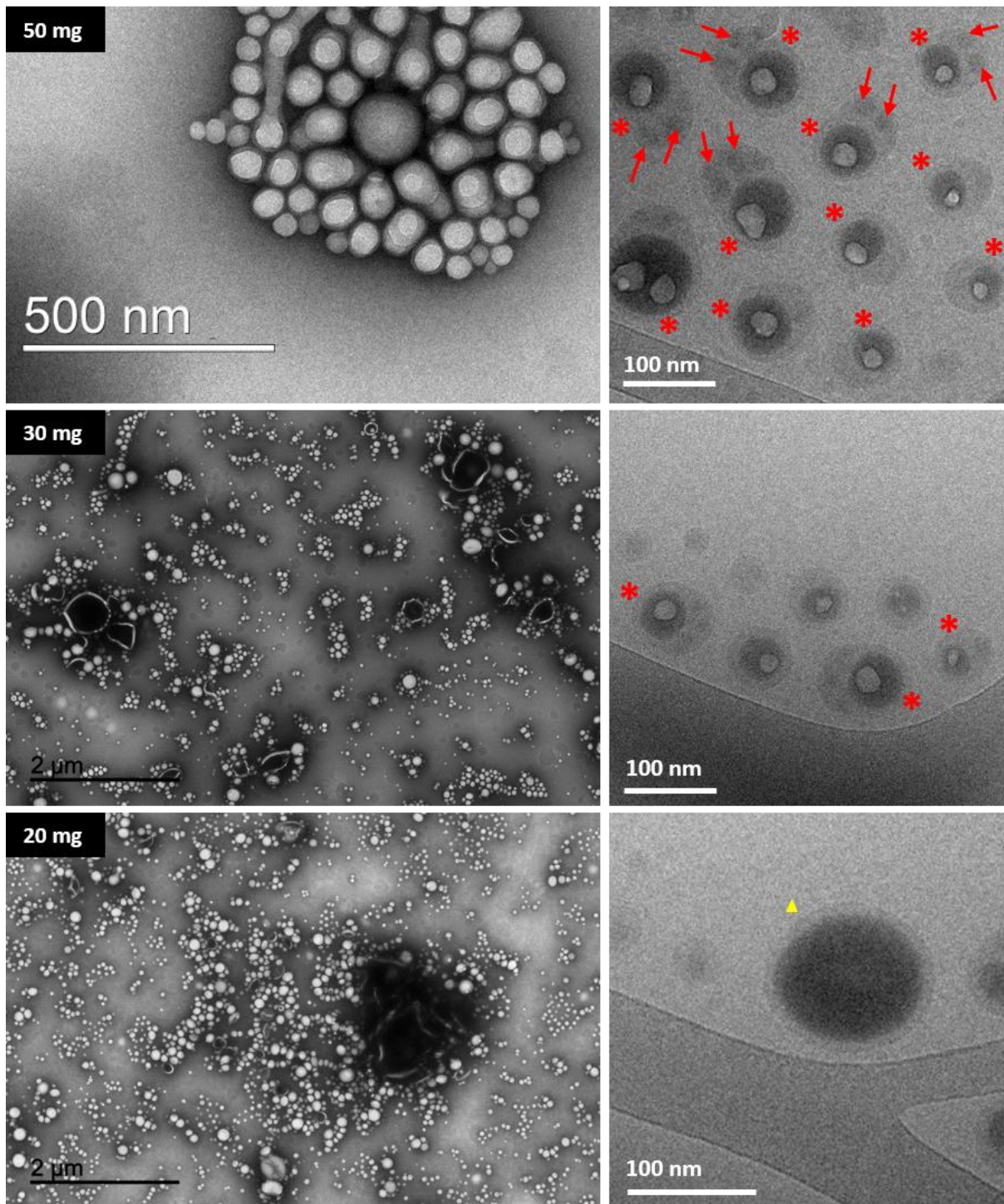


Figure S8: Additional TEM (left) and cryo-TEM (right) images of PEG-PLA-PFMA₁₀ NCs. Red stars show elongated NCs with a non-centered spherical PFOB core at high polymer amounts, with sometimes additional darker domains shown by red arrows. Yellow triangles show ellipsoidal NCs with a single non-spherical PFOB core and a shell thickness homogeneous within the same capsule

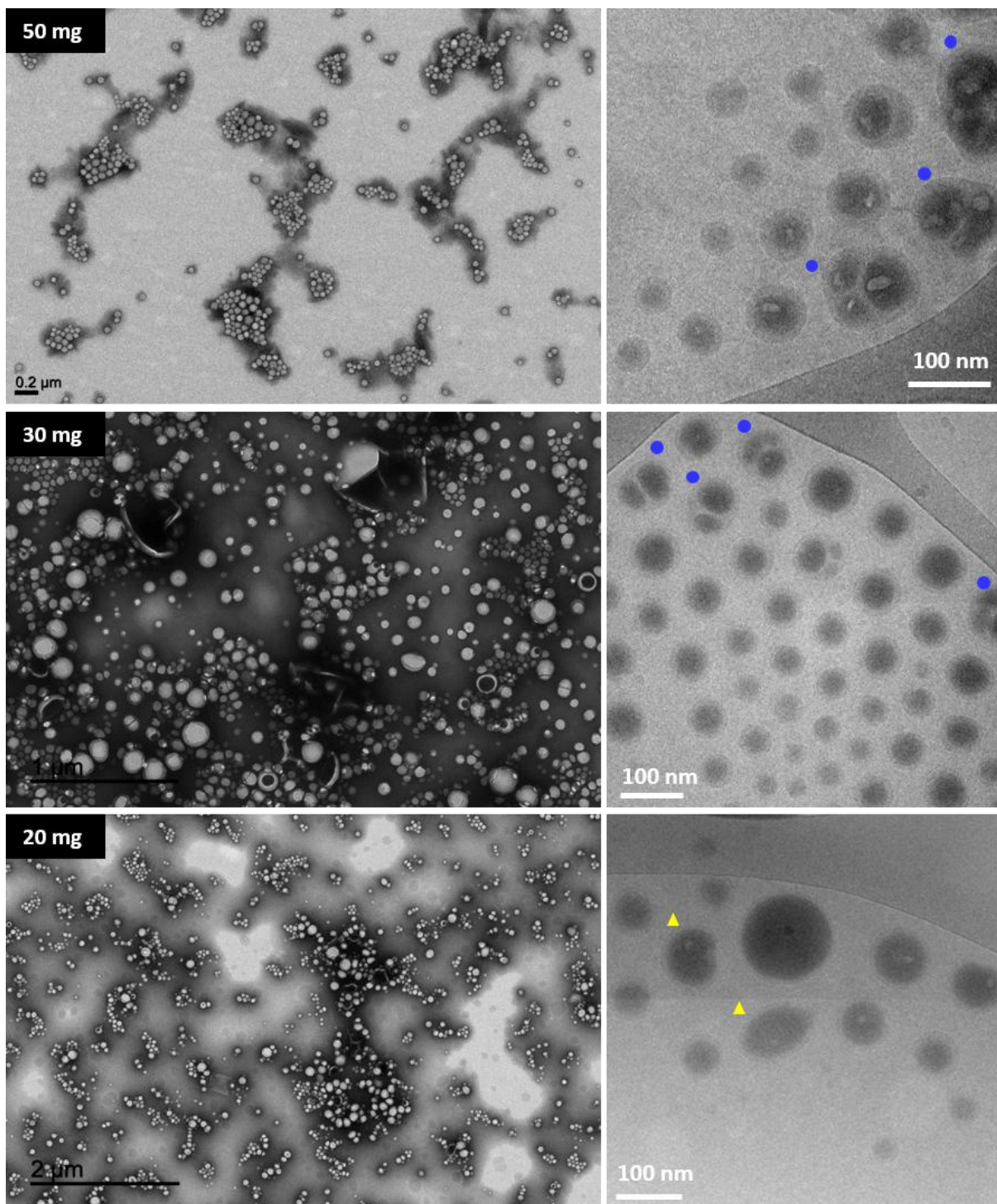
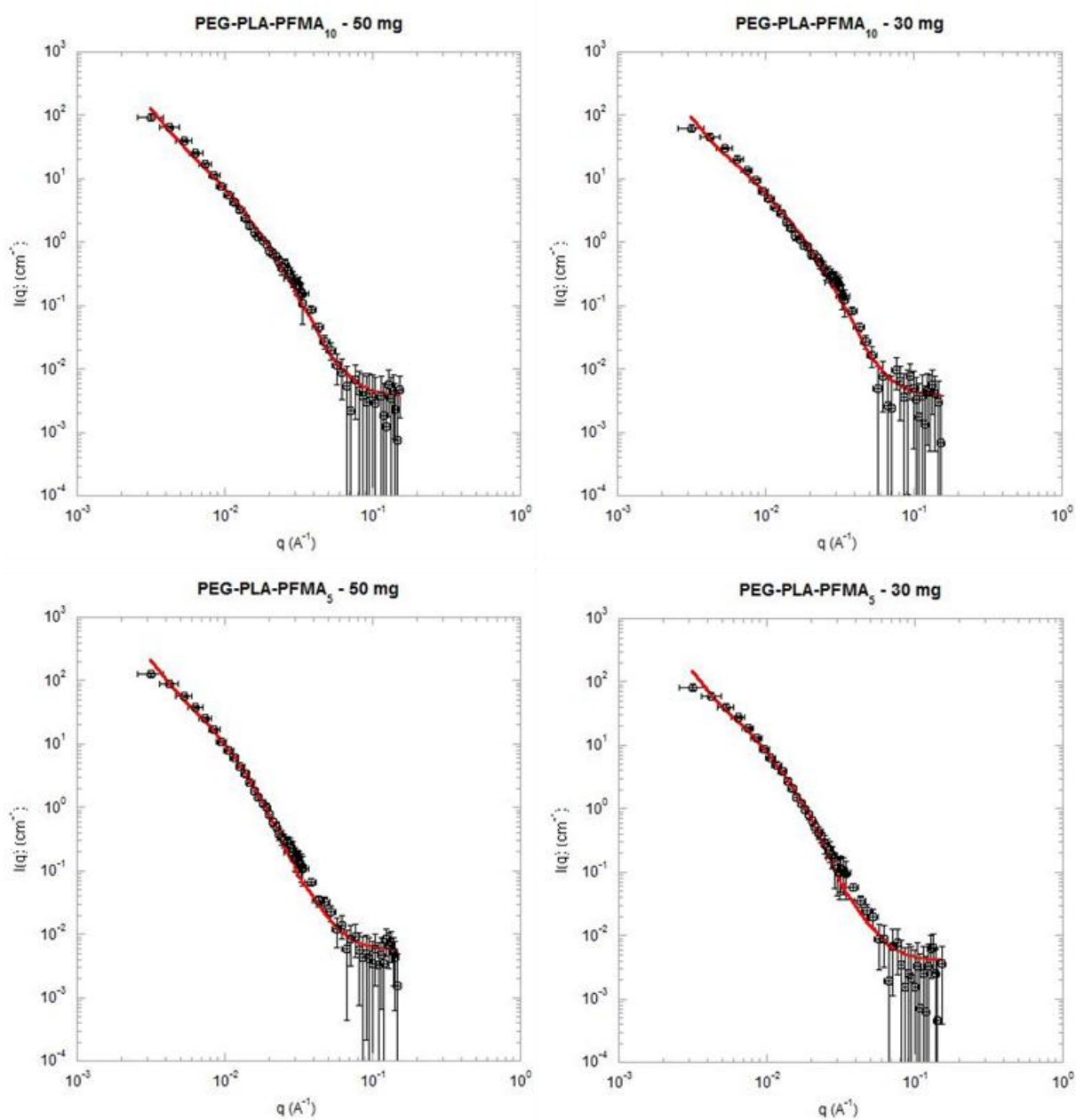


Figure S9: Additional TEM (left) and cryo-TEM (right) images of PEG-PLA-PFMA₂₀ NCs. Blue circles show NCs with 2 or 3 distinct PFOB cores. Yellow triangles show ellipsoidal NCs with a single non-spherical PFOB core and a shell thickness homogeneous within the same capsule

Table S1 : Geometrical parameters (shell thickness T and core radius R_{core}) of NCs obtained by curves fitting with the vesicle model

Polymer	50 mg		30 mg		20 mg	
	$T \pm \sigma_T$ (nm)	$R_{\text{core}} \pm \sigma_{\text{core}}$ (nm)	$T \pm \sigma_T$ (nm)	$R_{\text{core}} \pm \sigma_{\text{core}}$ (nm)	$T \pm \sigma_T$ (nm)	$R_{\text{core}} \pm \sigma_{\text{core}}$ (nm)
PEG-PLA	16 ± 4	56 ± 24	14.5 ± 4	56 ± 24	15 ± 3.5	56 ± 24
PEG-PLA-PFMA ₅	18.5 ± 6	54 ± 24	17.5 ± 5	53 ± 24	13.5 ± 4	56 ± 25
PEG-PLA-PFMA ₁₀	15.5 ± 5	55 ± 24	15 ± 3.5	56 ± 23	11 ± 3	53 ± 24



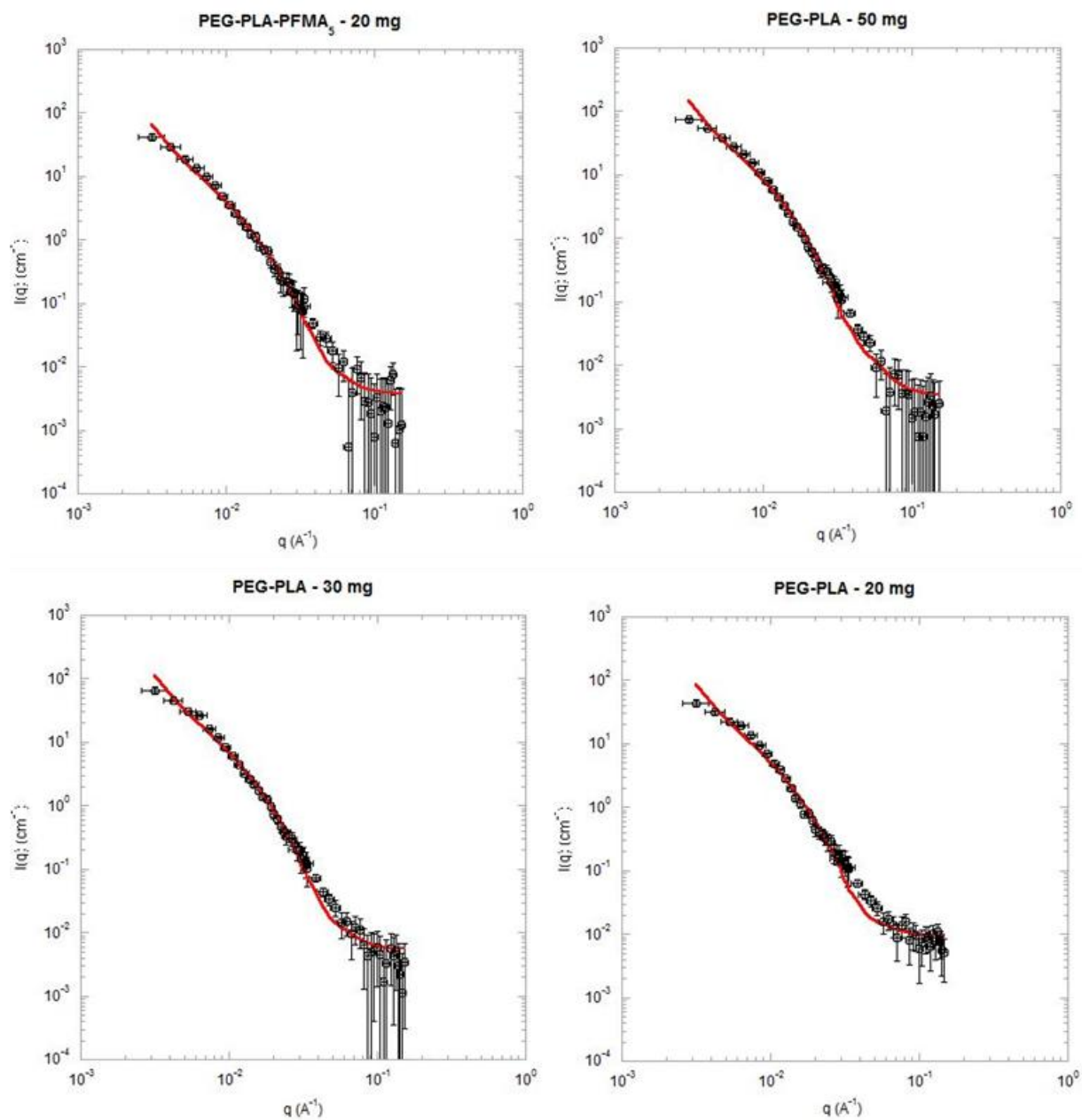


Figure S10 : Scattered intensity curves in PFOB matching condition (black circles) fitted with the vesicle model (red line)

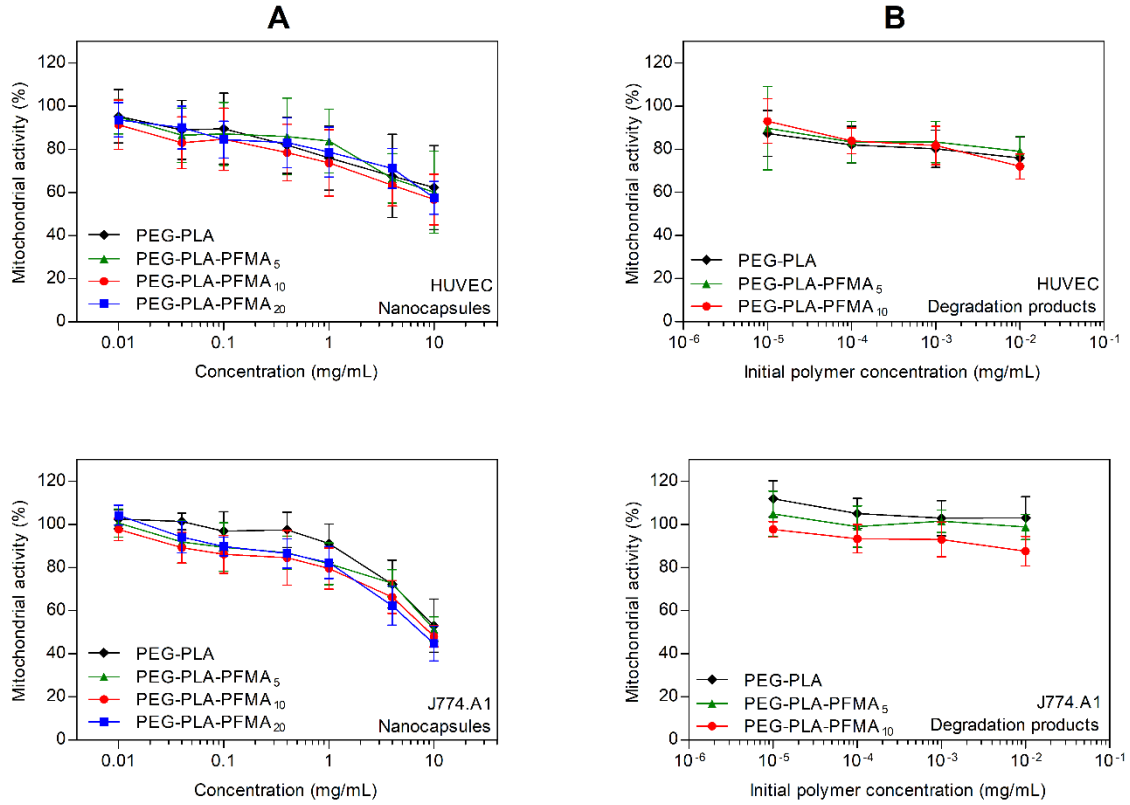


Figure S11 : Viability assays on HUVEC (top) and J774.A1 (bottom) cell lines after 24h incubation with nanocapsules (A) or polymers degradation products (B). Results are presented as mean \pm SD (n = 3)

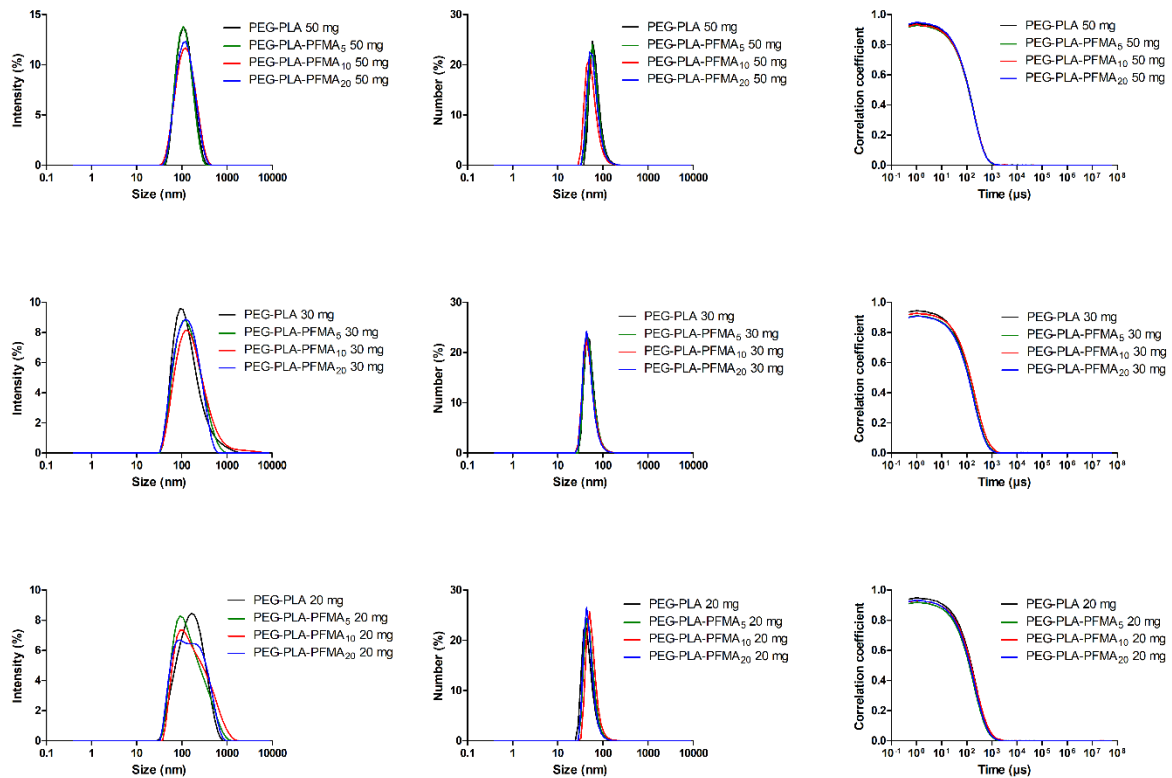


Figure S12 : DLS curves (correlation functions and distribution functions over hydrodynamic diameter) of NCs