Supplementary material (ESI) for Journal of Materials Chemistry

Size-controlled magnetoliposomes with tunable magnetic resonance relaxation enhancements

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Supporting Information

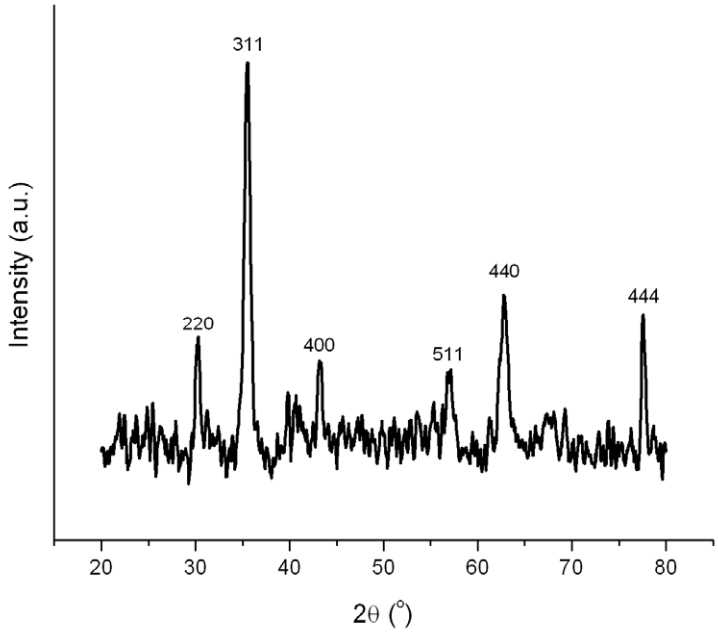

Fig. S1. Powder XRD pattern (using Cu K_α line) of PG/PG-SMLs.

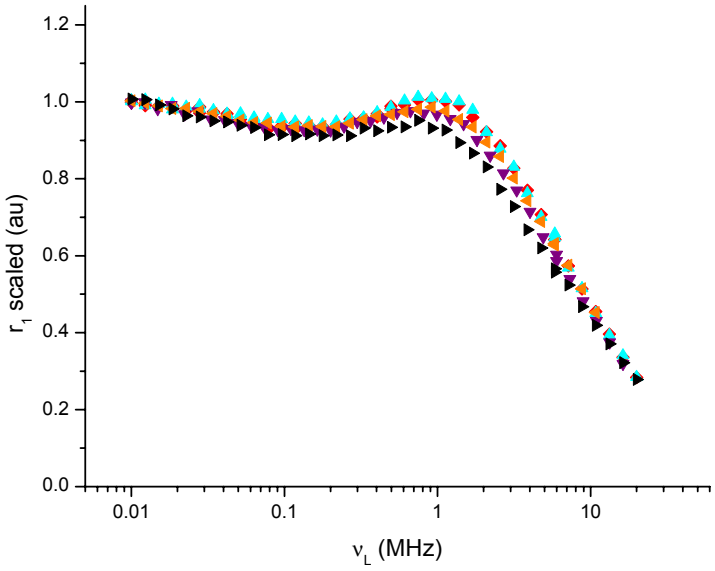

Fig. S2. Scaled r_1 profiles for PC/PG-SML samples with d_{hyd} of ♦ 80.9 nm (0.162), ▲ 85.3 nm (0.150), ▼ 102 nm (0.142), ◄ 114 (0.180), and ► 128 nm (0.130).

Table S1. Relaxivity data for SML suspensions.

Type	d_{hyd} (nm)	^{1}H Larmor frequency (MHz)	r_1 ($s^{-1}mM^{-1}$)	r_2[a] ($s^{-1}mM^{-1}$)	r_2/r_1
PG-PG	90	9.25	41	273	6.7
		40	8.2	166	20
PC-PG	115	9.25	63	453	7.2
PG-PG	110	40	40	919	23

a. Recorded using the CPMG sequence, using an echo delay of 50 μs.

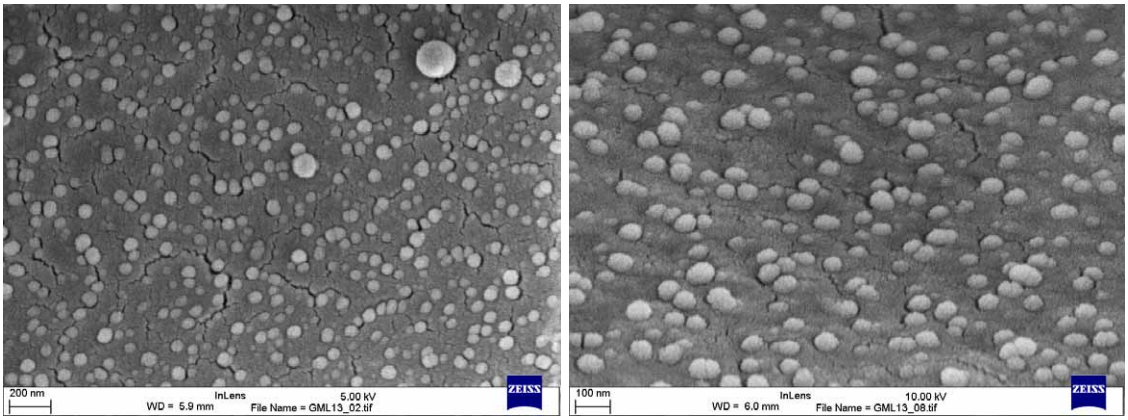

Fig. S3. Additional cryo-SEM images confirming a relatively narrow SML size distribution (average 50 nm). A small number of larger clusters were observed in some of the micrographs.

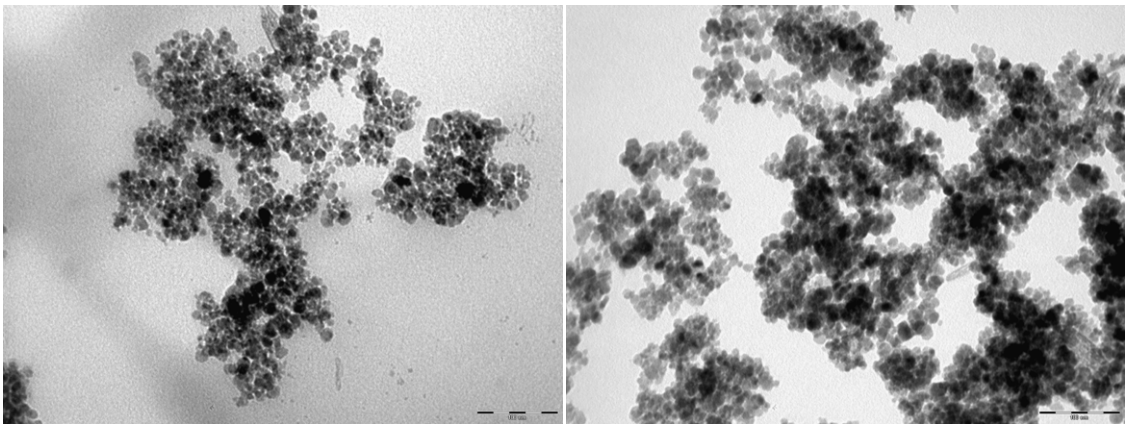

Fig. S4. Additional TEM images of primary NPs extracted from a PC/PG-SML sample.

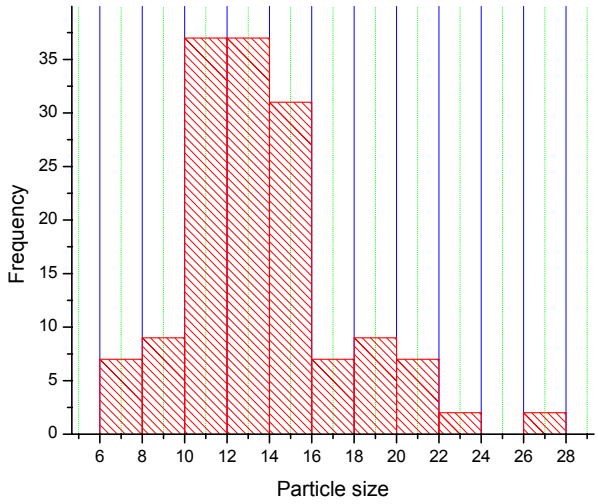

Fig. S5. NP size distribution from TEM analysis. D_{TEM} = 13.8 nm, SD = 3.7 nm (150 particle average).

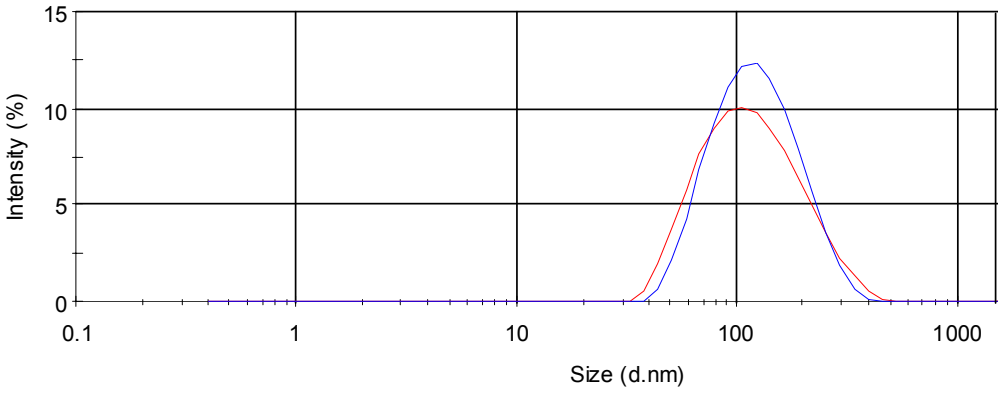

Fig. S6. PCS analysis of PG/PG-SMLs over time; initial suspension red data (d_{hyd} 110.1 nm); 2.5 years later blue data (d_{hyd} 110.4 nm).

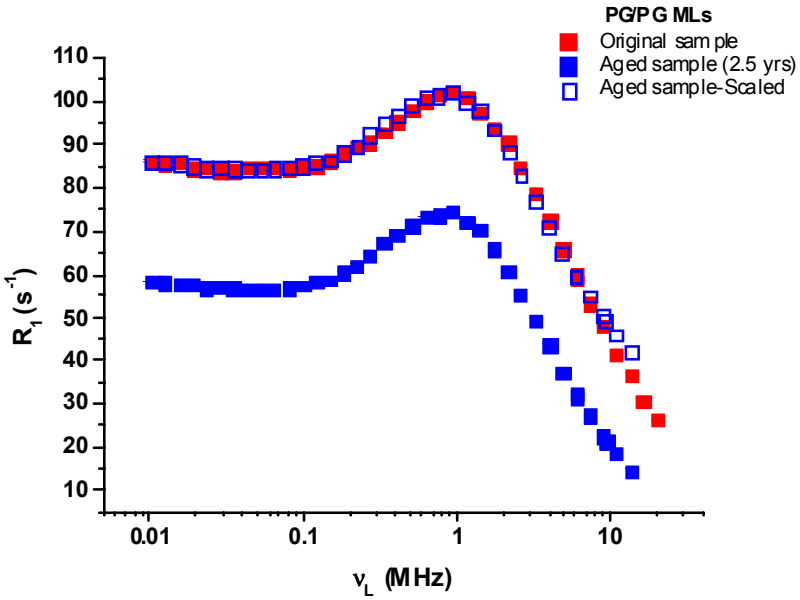

Fig. S7. Effect of time on the relaxation rate (R_1) of a PG/PG-SML suspension. Scaling by a constant factor confirms that after storage for 2.5 years at room temperature the shape of the profile has not changed (□), but that there has been about 30% decrease in the concentration of the suspension. This is a relatively minor loss, over such a prolonged period. There was no discernible precipitation in the sample, but there were some losses due to evaporation. We suggest that some material became adhered to the glass as the

meniscus very gradually fell away. This result suggests the possibility of producing suspensions with good shelf-life for real applications.

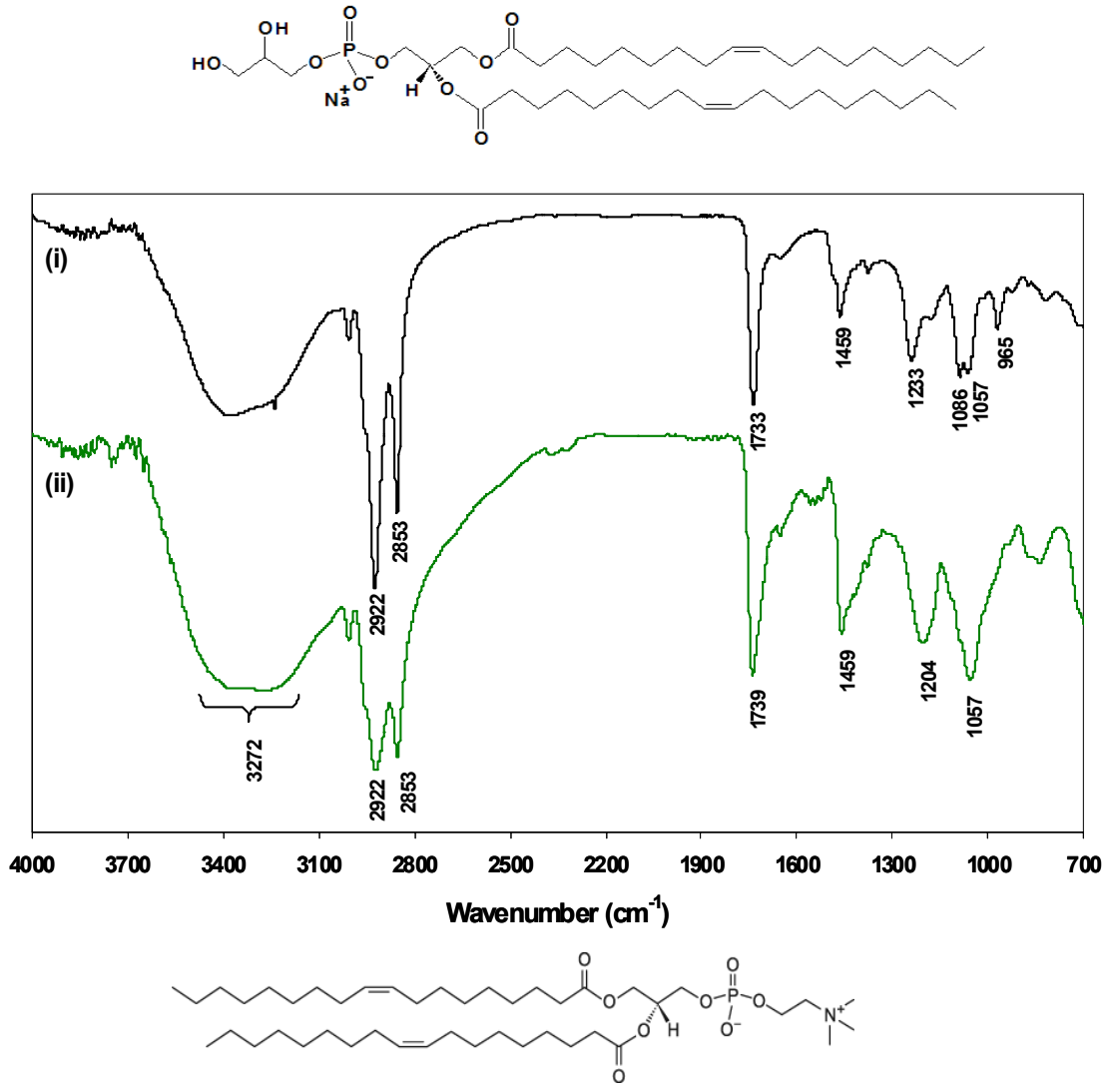

Fig. S8. ATR-IR spectra of (i) PC/PG-SMLs, and (ii) PG/PG-SMLs. Top, molecular structure of DOPG. Bottom, molecular structure of DOPC.

Table S2. Additional magnetic chromatography data for a PC/PG-SML suspension with d_{hyd} 114nm, PDI 0.182 (before magnetic chromatography).

Flow Rate (mL/hr)	**Magnetic Field (T)**	**d_{hyd} (nm)**	**PDI**
50	1.4	65.7	0.229
50	1.2	64.8	0.221
50	0.9	72.6	0.206
50	0.5	82.2	0.150
50	0.5	82.4	0.204
75	0.5	84.6	0.166
125	0.5	103	0.193
200	0.5	119	0.173
300	0.5	138	0.237
400	0.5	142	0.213