Electronic Supplementary Material (ESI) for Biomaterials Science.

SUPPORTING INFORMATION

Dual-drug delivery of curcumin and platinum drugs in polymeric micelles enhance the synergistic effects: A double act for the treatment of multidrug-resistant cancers

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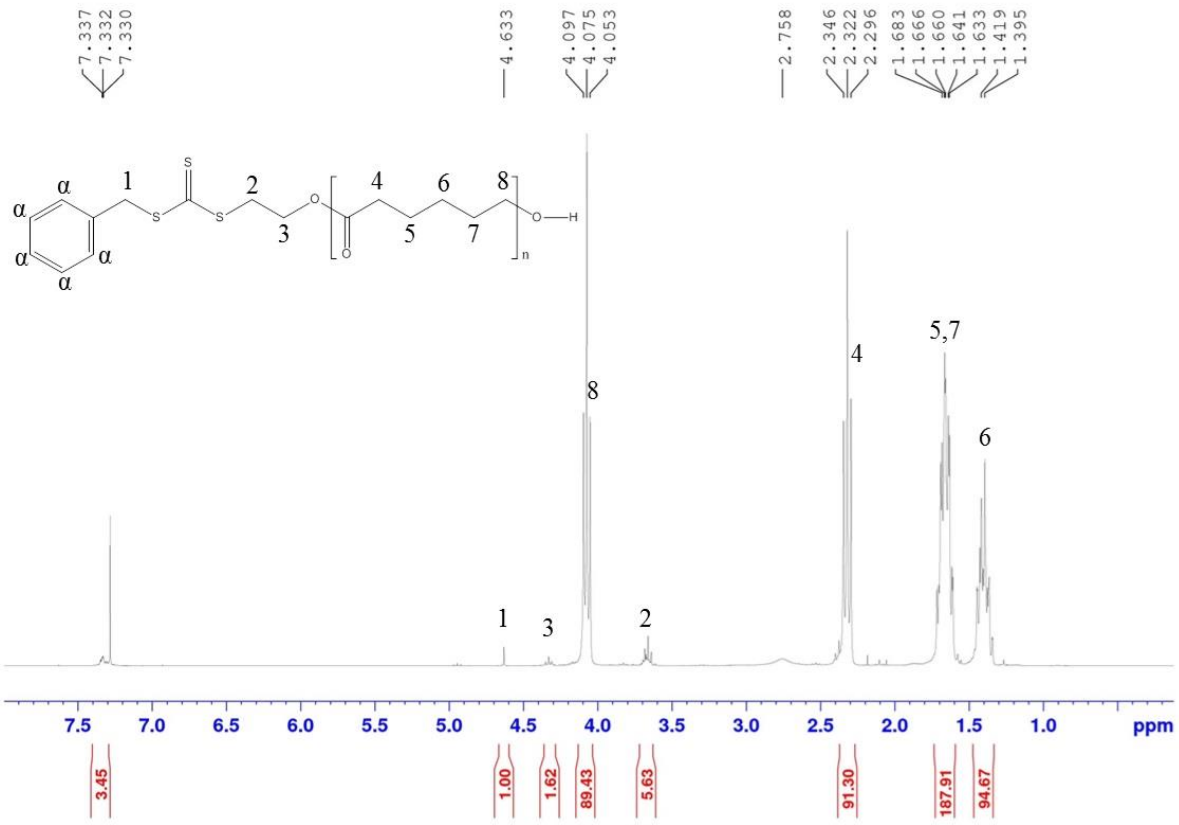

Figure S 1 ^{1}H-NMR spectra of poly ε-caprolactone

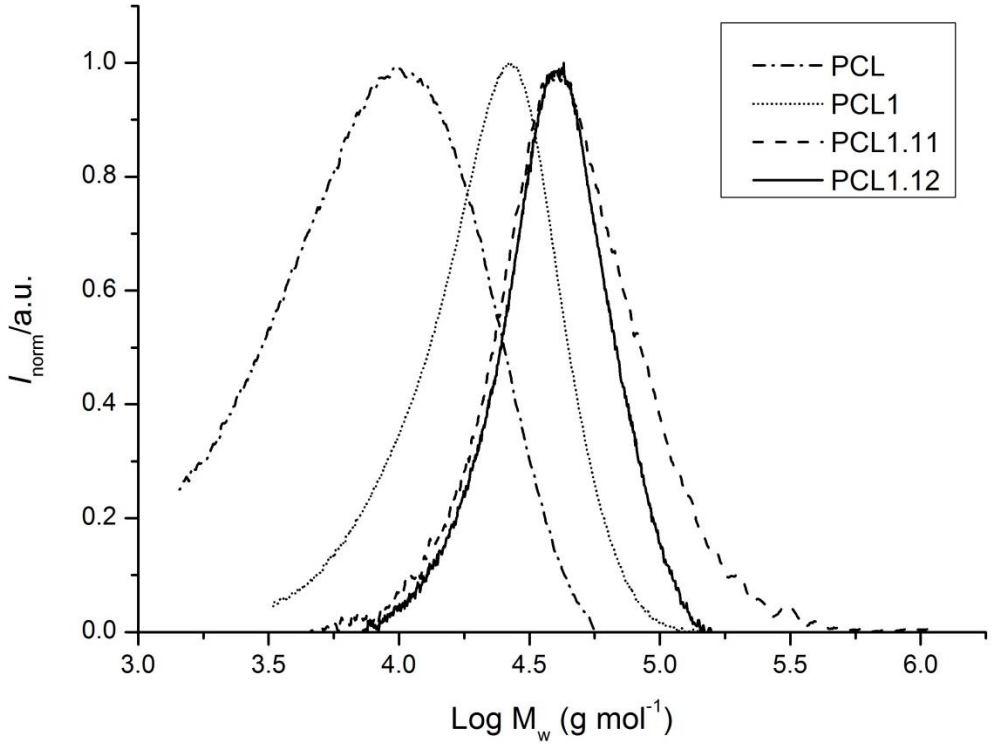

Figure S 2 *Overlay of SEC chromatograms of PCL (PCL_{50}), PCL1 (PCL_{50}-b-$POEGMEA_{37}$), PCL1.11 (PCL_{50}-b-$ABPA_{38}$-b-$POEGMEA_{37}$) and PCL1.12 (PCL_{50}-b-$ABPA_{32}$-b-$POEGMEA_{37}$)*

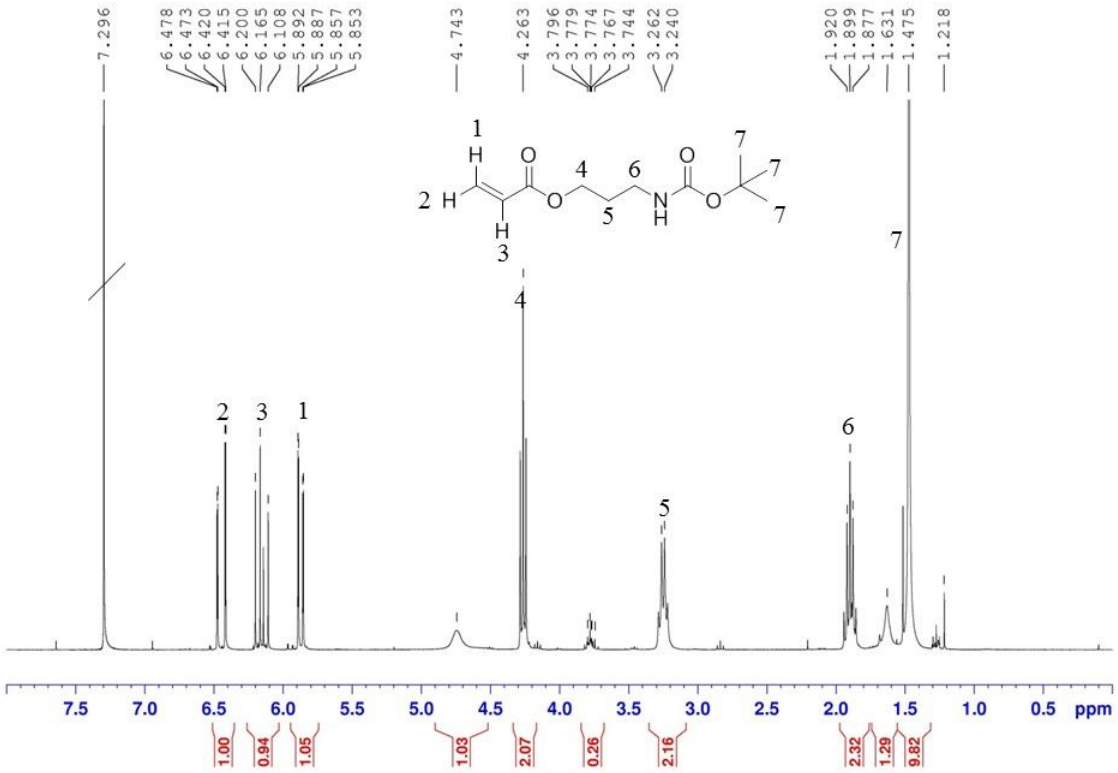

Figure S 3 ^{1}H-NMR of Boc protected 3-amino-1-propanol acrylate (ABPA) Monomer

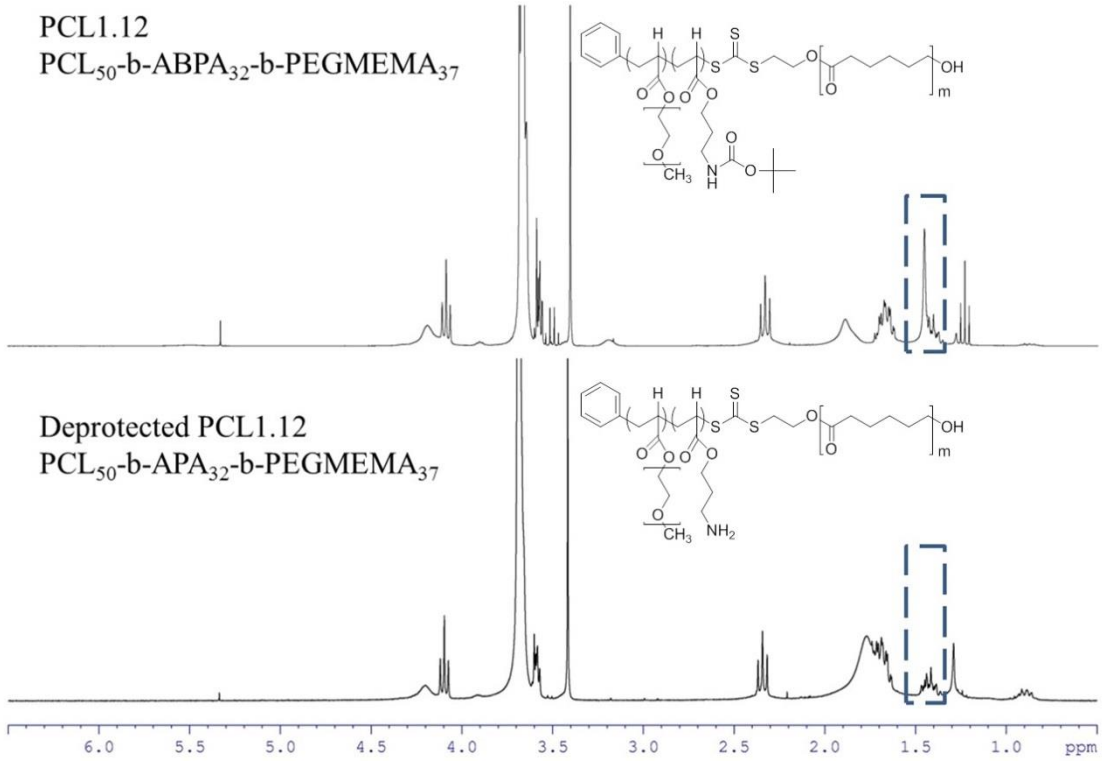

Figure S 4 [1]H-NMR for the deprotection of BOC protective group from ABPA after polymerisation

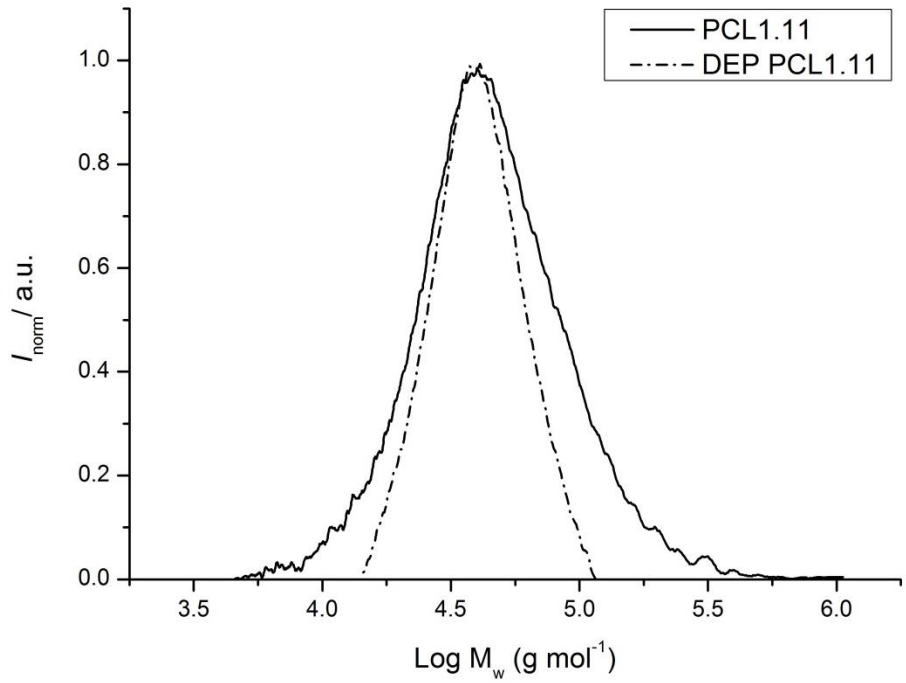

Figure S 5 Overlay of SEC chromatograms of PCL1.11 PCL1.11 (PCL_{50}-b-$ABPA_{38}$-b-$POEGMEA_{37}$) and the removal of tert-butyl protective group in acidic condition to yield DEP PCL1.11

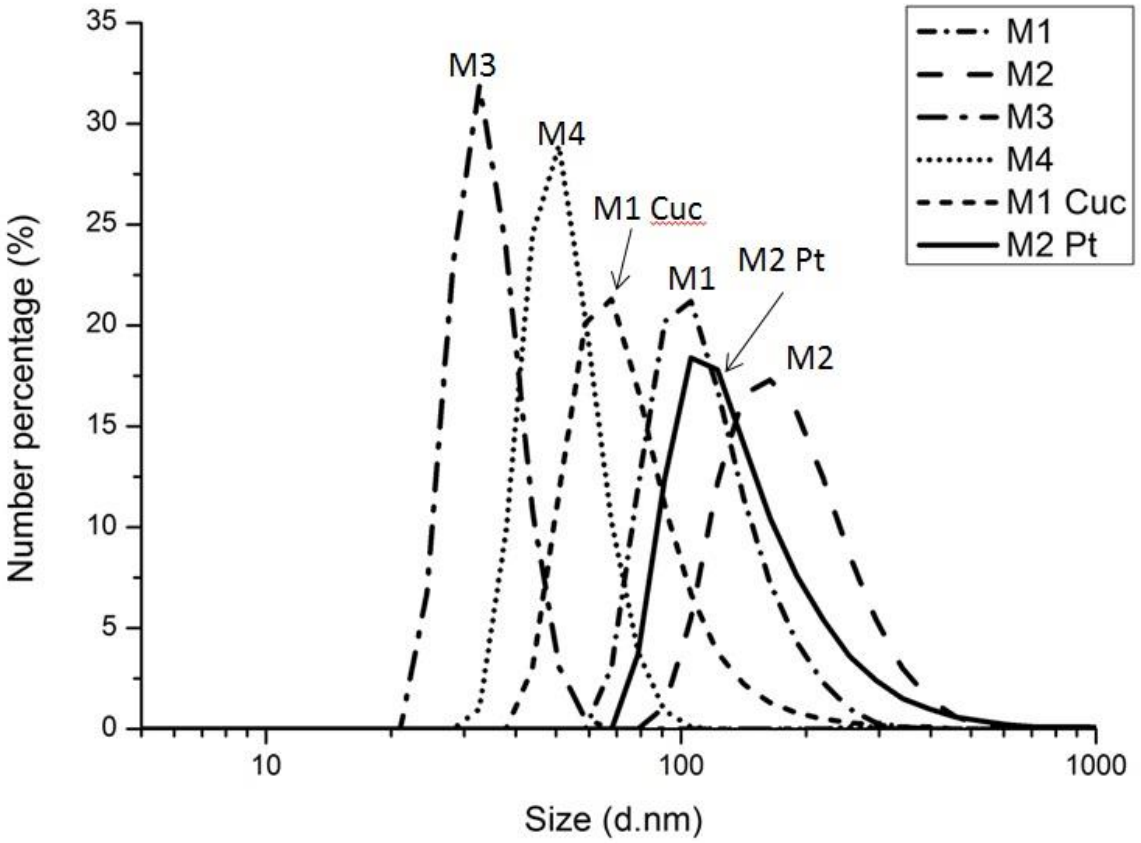

Figure S 6 Average hydrodynamic size distributioni of micelles: M1- PCL_{50}-$ABPA_{38}$-$POEGMEA_{37}$, M2- PCL_{50}-APA_{38}-$POEGMEA_{37}$, M3- PCL_{50}-APA_{38}- $POEGMEA_{37}$ Cuc + Pt, M4- PCL_{50}-APA_{38}-$POEGMEA_{37}$ Cuc + Pt (Freeze dried in redissolved in DMac), M1Cuc - PCL_{50}-$ABPA_{38}$-$POEGMEA_{37}$ Cuc, M2Pt- PCL_{50}-APA_{38}-$POEGMEA_{37}$ Pt

Calculation for synergistic effect using BioSoft - CalcuSyn

Experimental Design & Data for calculation

A schematic presentation for constant ratio of two drug combination design is given below.

Table S1 – Experimental design for cominational analysis of two drugs with constant ratio

Drug 1							
Drug 2		0	0.25 x	0.5x ED_{50}	1x	2x	4x
	0	Control	F_1	F_1	F_1	F_1	F_1
	0.25x	F_2	$C_{1,2}$				
	0.5x ED_{50}	F_2		$C_{1,2}$			
	1x	F_2			$C_{1,2}$		
	2x	F_2				$C_{1,2}$	
	4x	F_2					$C_{1,2}$

Free curcumin and Free platinum (IV) [$(COOH)_2$] was tested against A2780 ovarian cancer cells, The dose of the two individual drugs were chosen above and below the IC_{50} value in the ratio of 0.25, 0.5, 1, 2 and 4. The combinational experiment of the two drugs in their free form are kept at a constant ratio of 1:1 to each other, but the doses are varied to obtain various cell viability. The combinational experiment was repeated for mixed micelles for individually encapsulated drugs. The ratio between curcumin contained in micelle 1 and platinum contained in micelle 2 were kept to 1:1. Final experiment for cell viability using single micelle delivery vehicle were performed with serial dilution of the stock solution knowing that the ratio curcumin and platinum inside the micelle is also 1:1.

Cell Viability data pointed collected were inserted into the raw data tab of Calcusyn expressing concentration of drugs as μg/mL and effect as a ratio of cell death compared to control both in ascending order. (for example, effect of 0.95 equal 95% cell death.)