Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information

for

Synthesis and AIE Properties of PEG–PLA–PMPC based Triblock Amphiphilic Biodegradable Polymers

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Experiment section

Synthesis of 1-(4-methylphenyl)-1, 2, 2-triphenylethylene (TPE-Me). This reaction was performed following the modified procedures described in the literature. To a solution of diphenylmethane (3.70 g, 22 mmol) in dry THF (40mL), *n*-butyllithium in hexane (1.53 M, 13.7 mL) was added dropwise at 0 ^{o}C under argon atmosphere over a period of 30 min. 4-Methylbenzophenone (3.93 g, 20 mmol) was added then at that temperature and allowed to warm to room temperature with stirring for 6h. The reaction was quenched with addition of an aqueous solution of ammonium chloride and the organic layer was extracted with dichloromethane (3×100mL) and the combined organic layers were washed with saturated brine solution and dried over anhydrous $MgSO_4$. After filtration, the filtrate was concentrated in vacuum to obtain crude alcohol as white solid.

Under nitrogen atmosphere, the crude alcohol, p-toluene-sulfonic acid (910 mg) and toluene (160 mL) were added to a two-necked flask equipped with a Dean-Stark trap. The mixture was refluxed for 3 h and cool down to room temperature. The organic layer was washed with aqueous Na_2CO_3 solution (3×50mL), water and saturated brine solution. After rotary evaporation, the crude product was purified via recrystallization from dichloromethane and ethyl ether to afford pure compound as white solid. ^{1}H NMR (400 MHz, Chloroform-d) δ 7.19 – 6.98 (m, 15H), 6.91 (s, 4H), 2.25 (s, 3H).

***In vitro* degradation.** The copolymer PEG-*b*-PLA-*b*-PMPC was selected to carry out the degradation study *in vitro*. A series of copolymer were exposed to PBS (pH 7.4) or PBS containing Proteinase K (0.5 mg/ml). The solutions were incubated at 37 ^{o}C. These copolymers were removed from the solution at appropriate time intervals, vacuum dried to constant weights, and then weighed.

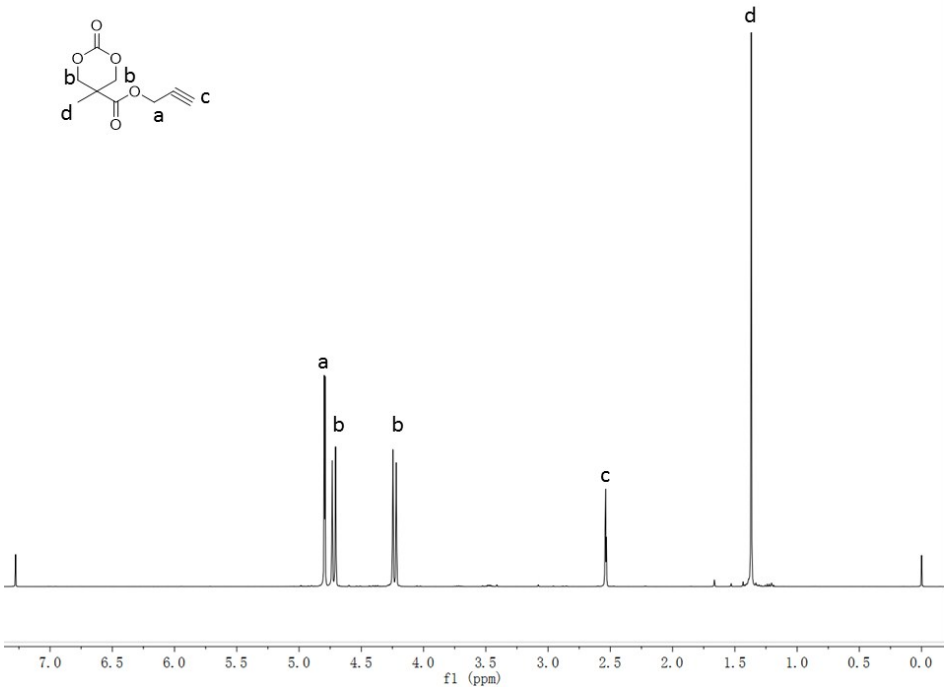

Figure S1 ^{1}H NMR spectrum (400MHz, chloroform-d) of MPC, δ 4.78 (d, J = 2.5 Hz, 2H), 4.70 (d, J = 10.7 Hz, 2H), 4.22 (d, J = 10.7 Hz, 2H), 2.52 (t, J = 2.5 Hz, 1H), 1.35 (s, 3H).

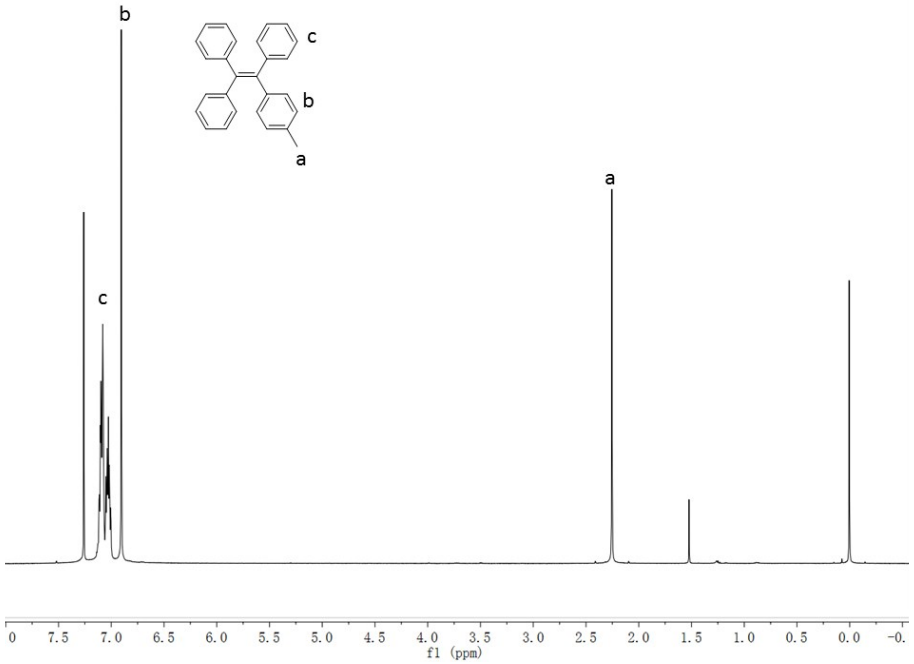

Figure S2 ^{1}H NMR spectrum (400MHz, chloroform-d) of TPE-Me, δ 7.19 – 6.98 (m, 15H), 6.91 (s, 4H), 2.25 (s, 3H).

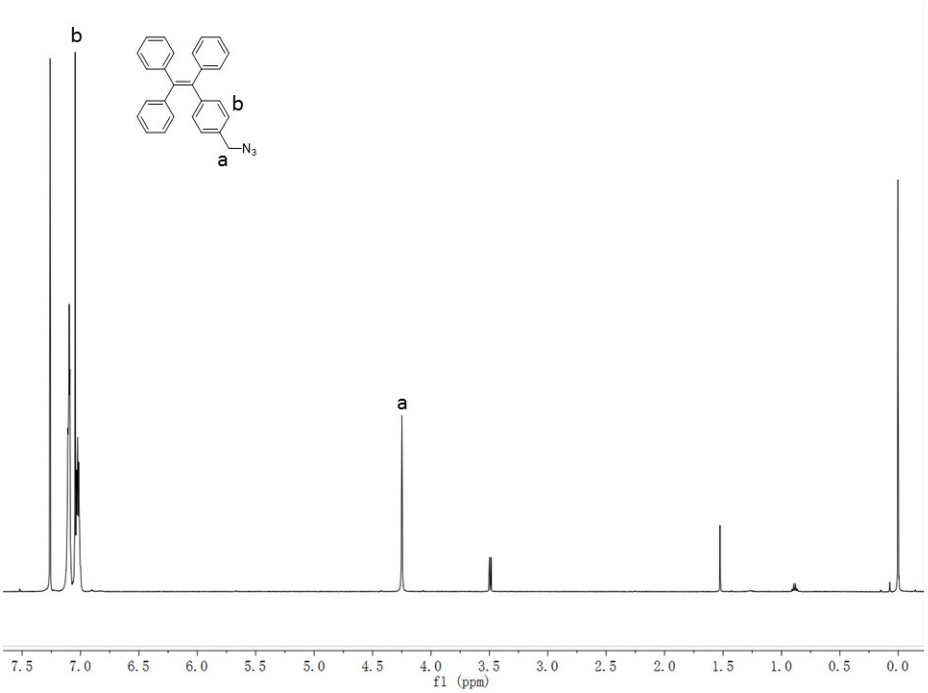

Figure S3 ^{1}H NMR spectrum (400MHz, chloroform-d) of TPE-N_3, δ 7.15 – 7.06 (m, 9H), 7.07 – 6.98 (m, 10H), 4.25 (s, 2H).

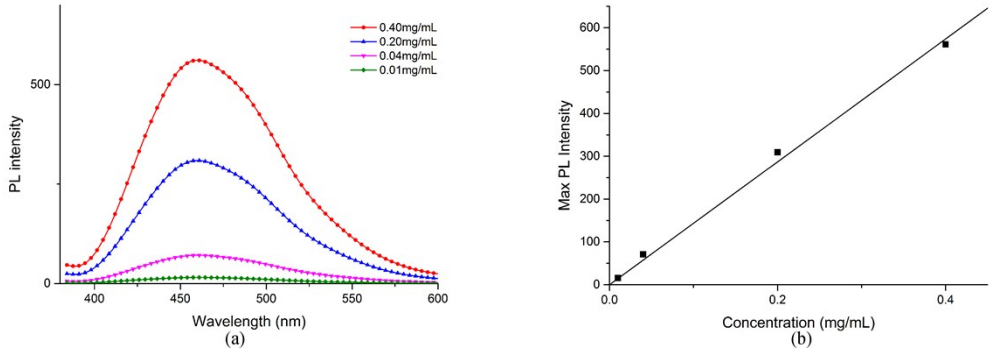

Figure S4 (a) Photoluminescence (PL) spectra of sample A under different concentrations; (b) plots of max PL intensity vs concentration. Conditions: excited at 364nm, water, 25 ^{o}C.

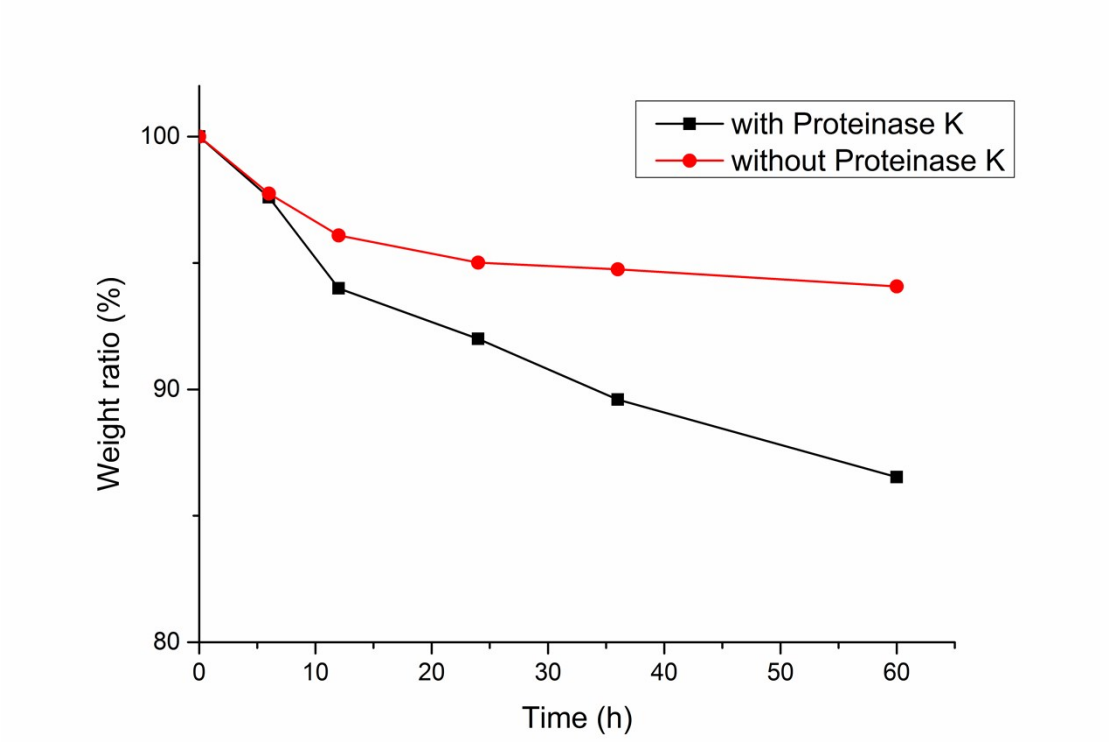

Figure S5 In vitro degradation of PEG-b-PLA-b-PMPC in PBS solution (0.01M, pH 7.4) at 37 oC with and without proteinase K. The dry weight ratio (Wt/Wo) is expressed as a function of digestion time (h). (Wo: original weight, Wt: weight after different digestion time)

Table S1 Original SEC-MALLS dates of PEG-PLA-PMPC.

Entry	dn/dc (mL/g)	$M_n \times 10^{-3}$	M_w	PDI	$K \times 10^{-2}$	α
1	0.0564±0.0006	4.456	5.076	1.139	2.659	0.711
2	0.0545±0.0005	8.463	9.755	1.153	2.552	0.706