Preparation of MPEG-PCLA block copolymer nanoparticles

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The synthesis of amphiphilic diblock copolymers was performed through a ring-opening copolymerization of D,L-lactide and ε-caprolactone with MPEG(monomethoxy poly(ethylene glycol)) as an initiator. The coupling reaction of the block copolymer and pH sensitive moiety was done by the 1,3-Dicyclo-hexylcarbodiimide(DCC) and 4-Dimethylaminopyridine (DMAP). Sulfonamide and histidine were used as pH sensitive moieties. Spirolactone (hydrophobic drug) loaded MPEG-PCLA-pH sensitive moiety block copolymeric nanoparticles were prepared using different techniques (simple emulsion (o/w), double emulsion (w/o/w), dialysis membrane and nanoprecipitation techniques). These particles have core-shell structure consisting of the hydrophilic outer shell of MPEG and the hydrophobic inner core of PCLA. The particles were characterized for their size and size distribution, morphology, drug loading content by dynamic light scattering (DLS), scanning electron microscopy (SEM), high performance liquid chromatography (HPLC). These nanoparticles could be potentially useful as a good novel carrier for the drug delivery.