Preparation and characterization of biodegradable MPEG-PCLA block copolymeric nanoparticles

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Nanoparticles of MPEG-PCLA are excellent candidates for the controlled release of many pharmaceutical compounds because of their biodegradable nature. The synthesis of amphiphilic diblock copolymers was performed through a ring-opening polymerization of D,L-lactide and ε-caprolactone with MPEG(monomethoxy poly(ethylene glycol)) as an initiator. The nanoparticles were prepared by a nanoprecipitation technique. We could control the size of nanoparticles by using different solvents. Spironolactone was used as a hydrophobic drug. These particles have core-shell structure consisting of the hydrophilic outer shell of MPEG and the hydrophobic inner core of PCLA. The size and size distribution, morphology, drug encapsulation efficiency (EE) of the spironolactone-loaded nanoparticles were then investigated by dynamic light scattering (DLS), scanning electron microscopy (SEM), high-performance liquid chromatography.