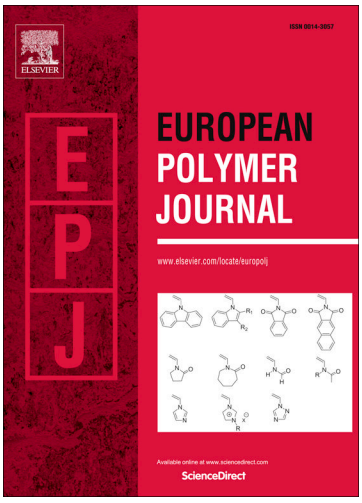


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# Co-assembly of block copolymers as a tool for developing novel micellar carriers of insulin for controlled drug delivery

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Abstract

In this study the co-assembly of two amphiphilic block copolymers with tailored composition and molecular characteristics, poly(ethylene oxide)-poly(ε-caprolactone)-b-poly(ethylene oxide) ($PEO_{113}$-b-$PCL_{35}$-b-$PEO_{113}$) and poly(2-(dimethylamino)ethyl methacrylate)-b-poly(ε-caprolactone)-b-poly(2-(dimethylamino)ethyl methacrylate) ($PDMAEMA_{20}$-b-$PCL_{70}$-b-$PDMAEMA_{20}$), was employed for preparation of a novel micellar system for controlled delivery of insulin. Mixed block copolymer micelles (MBCMs) of three different compositions were prepared by blending the two copolymers at molar ratios of 7:3, 1:1 and 3:7. Next, the electrostatic complexation between insulin and MBCMs with a focus on particle size, morphology, zeta potential and colloid stability as a function of insulin concentration in the aqueous solution was investigated by dynamic and electrophoretic light scattering as well as