Amphiphilic star-shaped block copolymers as unimolecular drug delivery systems: Investigations using a novel fungicide.

Knop K, Pavlov GM, Rudolph T, Martin K, Pretzel D, Jahn BO, Scharf DH, Brakhage AA, Makarov V, Möllmann U, Schacher FH, Schubert US (2013) Amphiphilic star-shaped block copolymers as unimolecular drug delivery systems: Investigations using a novel fungicide. *Soft Matter* 3(9), 715-726.

Details

Abstract

Amphiphilic star-shaped poly(ε-caprolactone)-*block*-poly(oligo(ethylene glycol)methacrylate) $[PCL_a$-*b*-$POEGMA_b]_4$ block copolymers with four arms and varying degrees of polymerization for the core (PCL) and the shell (POEGMA) were used to investigate the solution behavior in dilute aqueous solution using a variety of techniques, including fluorescence and UV/Vis spectroscopy, dynamic light scattering, analytical ultracentrifugation, and isothermal titration calorimetry. Particular emphasis has been applied to prove that the systems form unimolecular micelles for different hydrophilic/lipophilic balances of the employed materials. *In vitro* cytotoxicity and hemocompatibility have further been investigated to probe the suitability of these structures for *in vivo* applications. A novel fungicide was included into the hydrophobic core in aqueous media to test their potential as drug delivery systems. After loading, the materials have been shown to release the drug and to provoke therewith an inhibition of the growth of different fungal strains.

Involved units

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Identifier

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