Abstract

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Poly(lactic-co-glycolic) acid (PLGA) is one of the most successful polymeric molecule invented for biomedical use. PLGA‘s biggest advantage lies in its biodegradability and nontoxicity[Chyba! Záložka není definována.]. It has been approved by EMA for human use. Because of increasing number of protein or nucleic acid based drugs the need for sophisticated drug delivery systems grows. PLGA nanoparticles (NPs) present exactly such drug delivery system capable of encapsulating large variety of compounds[Chyba! Záložka není definována.].

Within this study we have researched optimization of separation and purification of drug loaded NPs. They were prepared by nanoprecipitation of PLGA[Chyba! Záložka není definována.]. Separation and purification of NPs was done using multiple cycles of centrifugation. We evaluated purification of particles prepared from five different PLGA polymers. Different centrifugation times were applied to find the most effective way. Water and two types of stabilizers each one in two concentrations have been used as purification media. Rhodamine B was used as a model drug because of its simple quantification by spectrophotometry. Separated NPs were characterized by recovery yield (RY) of PLGA and encapsulation efficacy (EE).

NPs prepared in 1% Kolliphor® P188 and separated in water show the highest % EE. However, NPs produced and separated in Pluronic® F-127 have generally higher % RY. As the most suitable polymers for Rhodamine B encapsulation proved linear PLGA 7-3 (LA-GA) and tripentaerythritol-branched PLGA.