ABSTRACT

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Title of thesis: Polymeric particles for targeted anti-inflammatory therapy

Macrophages are heterogenous population of cells, that play crucial role in inflammatory diseases like NASH. It was found that liver macrophages polarization into phenotype M1 is major factor in NASH progression. It seems that induced conversion from proinflammatory macrophages into anti-inflammatory is one of the potencial therapeutic target. This macrophages polarization can be achieved by drug delivery system based on drug-loaded nanoparticles.

The aim of this work was to prepare and optimize the preparation of nanoparticles formulation based on polymeric nanoparticles loaded dexamethasone as model substance. The nanoparticles formulation was prepared by nanoprecipitation method using three PLGA polymers with different lactic/glycolic acid ratios. Several surfactants in various concentrations were used to optimize preparation. Prepared dexamethasone-loaded nanoparticles were characterized in terms of their size and polydisperzity index using dynamic light scattering. Zeta potencial of nanoparticles was determine by electrophoretic light scattering and encapsulation efficiency was obtained by HPLC. The best results were obtained by using branched polymer PLGA A2 in combination with 0,5% cholate sodium and 1% Pluronic as surfactants, for linear polymer PLGA 50/50 combination of 0,1% Tween and for PLGA 75/25 0,5% Pluronic F-127. Produced nanoparticles showed acceptable properties for macrophage targeting.

Keyword: PLGA, nanospheres, corticosteroids, targeting, inflammation