

# ABSTRACT

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Title of Thesis: Preparation and evaluation of nanoparticles for targeted treatment of inflammatory diseases

Nanoparticles are used in the health sciences for, among other things, targeted drug delivery. This is used for the therapy of cancer and chronic inflammatory diseases.

The aim of this diploma thesis was to prepare nanoparticles suitable for targeted treatment of inflammatory diseases. The task was to determine the ideal concentration of the active substance, which would ensure high encapsulation efficiency and drug loading. The difference between nanoparticles prepared from PLGA 5/5E and PLGA 7/3A was also investigated.

Nanoparticles were prepared by the nanoprecipitation method. The matrix of the nanoparticles was composed of PLGA with different ratios of lactic acid and glycolic acid. Acetone was used as the organic solvent. The encapsulated active substance was the anti-inflammatory dexamethasone acetate. The aqueous phase consisted of a 0.1% aqueous solution of Pluronic F-127. The evaluated parameters of the resulting nanoparticles included size, polydispersity index, zeta potential, encapsulation efficiency, and drug loading.

The results indicate that the concentration of active substance used for the preparation had the greatest influence on the properties of the nanoparticles. The type of used polymer had no significant impact on the final nanoparticles.

Key words: Nanoparticles, polymers, biodegradability, macrophages, inflammation, targeting