

## **ABSTRACT**

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Title of thesis: Acidoresistant polymeric nanoparticles: preparation and assessment

Use of oral drug delivery nanosystems has a great potential in therapy of inflammatory bowel disease, which includes Crohn's disease and ulcerative colitis. Nanosized delivery systems are more efficiently accumulated at the inflammatory site, targeting specifically macrophages to resolve inflammation locally and reduce systemic adverse effects.

The aim of this research was to prepare pharmaceutical formulations based on polymeric nanoparticles. Three types of poly(lactide-co-glycolide) – two linear and one branched polymer – together with the acidoresistant polymer cellulose-acetate phthalate (CAF) in various ratios were used to prepare nanoparticles by nanoprecipitation method. Rhodamine B was used as model active substance. The effect of acidoresistant component content on size and zeta potential of the nanoparticles was evaluated. Furthermore, dissolution tests were performed at both acidic and physiological pH.

It was found that CAF doesn't have any significant effect on size of the particles and their stability. Moreover, the release of rhodamine B in the acidic environment decreases with increasing proportion of CAF in the nanoparticles. Nevertheless, the nanoparticles consisting only from poly(lactide-co-glycolide) also showed acidoresistance that could be explained by their physicochemical properties determined by increased carboxyl content within branched polymer structure.

**Keywords:** nanoparticles, biodegradability, acidoresistance, PLGA, cellulose-acetate phtalate