

Abstract

Cancer diseases are the most common cause of death over the world. One fifth of death is caused by cancer in the Czech Republic. The big problem in the treatment of cancer diseases are side effects of chemotherapy, which make treatment more difficult for patients. The present bachelor thesis is focused on synthesis and characterization of novel polymer carriers. Polymer carriers can target the cytostatic drug to the tumor tissue and minimize side-effect of chemotherapies. This bachelor thesis is focused on synthesis and physical chemistry characterization of new diblock polymer carriers, specifically carries of docetaxel. Successful synthesis of novel water-soluble polymer precursors and conjugates based on *N*-(2-hydroxypropyl)-methacrylamide is described and discussed in this thesis. The hydrolytic stability of the synthesized diblock systems was studied in 0,3M phosphate buffer at pH 7,4 simulating the bloodstream environment. It has been successfully verified that the synthesized polymer systems are hydrolytically degradable after fulfilling its role of drug carrier and therefore can be finally excreted from the organism. The effect of the type of oxoacid used for modification of the cytostatic on the release rate of the carried cytostatic from the polymeric carriers was thoroughly evaluated and proved. Finally, the *in vitro* cytotoxicity of the prepared polymer conjugates was studied to demonstrate the reduced cytotoxicity of the drug bound to the polymeric carrier.

Key words: anti-cancer, nanomaterial, biodegradation, polymer carrier, drug

(in Czech)