Abstract

This thesis focuses on the preparation and characterization of polymer carriers based on *N*-(2-hydroxypropyl)methacrylamide (HPMA) and *N*-(1,3-dihydroxypropyl)methacrylamide (DHPMA) designed for the delivery and controlled release of betulinic acid (BA) derivatives in tumor tissue. Polymer precursors containing hydrazide or primary amino groups were synthesized and thoroughly physico-chemically characterized, along with their conjugates with functional BA derivatives bearing an oxo group, attached via a pH-sensitive hydrazone bond or a Schiff base. The hydrolytic stability of these conjugates was evaluated at physiological pH (7.4) as well as their ability to release the drug at pH simulating the tumor microenvironment (5.0). Furthermore, the cytotoxic activity of BA derivatives and their polymer conjugates was assessed *in vitro* on the human colorectal adenocarcinoma cell line DLD-1. The results demonstrate that polymer carriers based on HPMA and DHPMA are a promising platform for the targeted delivery of BA derivatives, with their biological efficacy being significantly influenced by the structure of the drug and the type of chemical linkage.

Keywords: polymer drug carriers, HPMA, DHPMA, betulinic acid, *in vitro* testing