Abstract

Chronic inflammatory diseases are very common and affect lives of many people around the world. Moreover, in long-term effect chronic inflammation can lead to the development of such complications as diabetes, atherosclerosis and oncological diseases. Temporary therapy does not lead to complete recovery of a patient, but can provide a relief of symptoms by means of immunosuppression, which causes many adverse effects, because of long-term and nonselective drug activity. Application of the polymeric drug delivery systems is one of the actively researched ways for the improvement of inflammatory diseases treatment quality, which enables longer circulation, better distribution and controlled release of the drug. Dexamethasone is one of the commonly used glucocorticoid drugs used for treatment of chronic inflammatory diseases. Properties of this drug can be enhanced via polymeric drug delivery systems. Recently, so-called biological treatment, particularly employing monoclonal antibodies, against inflammation was introduced into the clinical use. One of such is infliximab – chimeric monoclonal antibody, which acts like the inhibitor of tumor necrotizing factor α (TNF-α).

Presented bachelor thesis focuses on the synthesis and characterization of a polymer conjugates based on *N*-(2-hydroxypropyl)methacrylamide (HPMA) copolymer carrying infliximab and dexamethasone bound via pH-sensitive bond. Prepared system has been subsequently characterized by means of a number of analytical and biochemical methods. The special emphasis of the thesis has been placed on the observation of anti-inflammatory drug release from the polymeric carrier *in vitro* in the environment resembling conditions in organism and the evaluation of the HPMA-copolymer modified antibody binding activity. Obtained results demonstrate high potential of the prepared system, thus further optimalization of *in vitro* characterization methods and *in vivo* study of the conjugate in the nearest future is envisioned.

Keywords: anti-inflammatory therapy, nanomaterial, dexamethasone, polymer carrier, active targeting.

(In Czech)