

## Abstract

The aim of the thesis is to introduce cell penetrating peptides as a potential way of transporting cargo into cells. Their ability to penetrate cell membranes with attached cargo is demonstrated. The structure and sequences of these peptides, on which their unique property to penetrate through the cell membranes is built, are described with respect to the different modes of transport. The difficulty of internalizing these CPPs via endocytosis is the frequent trapping of peptide with attached cargo in the endosome. If this occurs, the endosome content is degraded and the CPP with attached cargo is not released into the cytosol or nucleus, their target site. This work focuses on creative options, how to make release from endosome easier for CPPs with attached cargo. The introduction of such modified CPPs would accelerate their use in clinical medicine to enable the treatment of diseases such as cancer or antibiotic-resistant diseases.