Abstract

This bachelor thesis deals with modification of known inhibitor KYT-36 specific for the *Porphyromonas gingivalis* protease called gingipain (Kgp).[1] Proposed modification with an oligoethylenglycole linker in suitable position will enable the use of the derivative in the iBodies concept.[2] These polyfunctional macromolecules based on a polymer backbone are capable of replacing antibodies in biochemical experiments in the study of enzymes.

The main aim of the thesis is to propose and perform an effective synthetic strategy. This thesis includes an analysis of a crystal structure of enzyme Kgp with the inhibitor KYT-36 (PDB ID: 6I9A).[3] The analysis enabled a choice of an appropriate modification site. A suitable functional group was added to the selected fragment allowing attachment of the linker. The linker's design was based on requirements for the intended use within the iBodies concept. One of them being a suitable functional group at the end of the chain ensuring an effortless conjugation with polymer backbone. Based on a retrosynthetic analysis, a synthetic strategy of the inhibitor core was proposed. This strategy builds upon the Passerini reaction.

Key words: *Porphyromonas gingivalis, gingipain, inhibitor, KYT-36, iBodies, Passerini*