ABSTRACT

Dental enamel is the hardest tissue of the body. It is formed by an evolutionarily highly conserved biomineralization process that is controlled by proteins of extracellular matrix. Amelogenin (AMEL) and ameloblastin (AMBN) are key element of the correct enamel formation. Simultaneously the proteins serve as a cell adhesion molecule that regulates proliferation and differentiation of ameloblasts (the cells involved in dental enamel formation). AMEL and AMBN belong to the family of intrinsically disordered proteins (IDPs) therefore it is very difficult to find a methodology for studying the structure and action of molecular mechanism.

This bachelor´s thesis is aimed at optimization of preparation process of photolabile protein "nanoprobes" of ameloblastin and amelogenin using recombinant expression in *E. coli* by incorporation of the photolabile analogs of amino acids (methionine, leucine). The prepared protein " nanoprobes " will be used to study protein-protein interactions in solution and to elucidate the structure-function relationships of human dental enamel proteins (ameloblastin, amelogenin). (In Czech)

Keywords: Dental enamel
Ameloblastin
Amelogenin
Photolabile protein "nanoprobes"
Mass Spectrometry