

Title: Study of biomolecular interactions by the method of surface plasmon resonance

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Abstract:

In this diploma work, a surface plasmon resonance (SPR) biosensor technology was exploited to study two different classes of molecular interactions: hybridization of partially complementary oligonucleotides (ONs) and interactions between enzymes and peptides involved in pathogenesis of Alzheimer disease (AD).

In particular, the study of interactions between ONs was focused on determining kinetic parameters of the hybridization proces. It was found that the association equilibrium constant decreases with the increasing surface probe density.

An SPR biosensor-based method for rapid and sensitive detection of the 17 β -HSD10 enzyme and its complex with amyloid β (A β) peptides was designed and developed. It was demonstrated that the developed method is capable of detecting 17 β -HSD10/A β s complex in real cerebrospinal fluid (CSF) samples and that CSF samples from AD patients exhibited elevated levels of 17 β -HSD10/A β s complex compared to the control groups.

The research reported in this thesis resulted in two publications in peer-reviewed scientific journals.

Keywords: surface plasmon resonance, oligonucleotides, Alzheimer disease