**ABSTRACT**

Forkhead transcription factor FOXO4 is involved in a wide range of processes including metabolism control, cell cycle regulation, apoptosis, DNA repair or oxidative stress resistance. The crystal structure of FOXO4 DNA-binding domain bound to the target DNA revealed that FOXO4 interacts with DNA in the same manner as other forkhead proteins. The DNA-binding interface consists of helix H3, which binds to the major groove of DNA, the N-terminal segment and flexible loops located at the C-terminus of forkhead domain. However, many questions concerning the regulation of DNA-binding specificity and the role of different parts of forkhead domain in this process remain elusive. In this diploma thesis, the interactions between the DNA-binding domain of FOXO4 and DNA with various sequences were studied. The DNA-binding domain of FOXO4 and its mutants were expressed and purified and their DNA-binding properties were studied using fluorescence spectroscopy techniques and surface plasmon resonance. Results of these experiments revealed that the nucleotide sequence at the 5′ end of the consensus binding motif affects the stability of the complex between the DNA-binding domain of FOXO4 and DNA. In addition, the importance of individual amino acid residues of FOXO4 that are involved in DNA binding for the stability of the FOXO4:DNA complex was clarified.