

Abstract

The diploma thesis „Epigenetic nature of the telomerase protein subunit chromatin in *Nicotiana tabacum* model plant“ deals with the regulation of this subunit on the transcriptional level and the role of epigenetic modifications in this process in the *Nicotiana tabacum* (tobacco) model plant. Tobacco represents unique system because in tobacco genome three sequence variants of the gene coding for telomerase catalytic subunit - *TERT* were identified.

In the theoretical part of the thesis the ends of eukaryotic chromosomes – telomeres, their maintenance and elongation by telomerase are described, and characterization of epigenetic modifications of DNA and histones influencing properties of chromatin and gene transcription is presented.

In the practical part of the diploma thesis, transcription of *TERT* gene variants in *N. tabacum* and *N. sylvestris* (donor of the mother genome part) tissues and modifications of histones in tissues with the positive and negative telomerase activity were analysed. Next, the influence of synthetic phytohormones on the *NtTERT* transcription during *N. tabacum* seeds germination was investigated.

The transcription profile of *NtTERT* gene variants indicated that the *NtTERT-C/t* variant is relevant for telomerase activity and the pseudogene *NtTERT-D* is probably involved in negative regulation of telomerase activity. The treatment of tobacco seeds by synthetic auxins during germination increased the level of *NtTERT-C/t* variant transcript, the synthetic cytokinin didn't cause any changes in the *NtTERT* transcription profile. The epigenetic study showed significant differences in chromatin structure between seedling (telomerase-positive tissue) and mature leaves (telomerase-negative tissue). The results were discussed with analogous study in *Arabidopsis thaliana* model plant.