

The work is focused on the lateral roots, which are an indispensable part of the root system and play a key role in communication with rhizosphere and the efficient exploitation of natural resources. Tetratricopeptide-repeat Thioredoxin-like 3 gene (TTL3) was identified by forward screening based on its gene expression pattern in the search for genes associated with the development of lateral roots in *Arabidopsis thaliana*. TTL3 also known as VIT (VH1 interacting TPR containing protein), belongs to a family of four paralogues in *Arabidopsis* showing a very similar arrangement of domains. It seems that this type of proteins is widespread in plants and provides protein-protein signaling as an important component of phytohormone response pathways. The presented diploma thesis is focused on characterization and comparison of expression patterns of the four members of TTL family, through creation of pTTL::uidA (GUS) transcriptional fusions. The promoter area was estimated to be contained in about 2000bp upwards the TTLs coding sequences and transcriptional fusions with uidA gene were individually constructed and transformed into *Arabidopsis* via *Agrobacterium tumefaciens*. The expression patterns of analyzed genes were microscopically confirmed and allowed comparison among members of TTL gene family with regard mainly to the development of lateral roots. Possible mechanisms of interaction and potential roles of TTL proteins are discussed.