Abstract

Recently, we identified Phosducin-like2 (AtPhLP2) in *Arabidopsis* as a possible regulator of growth and development that could be involved in the non-transcriptional auxin response in roots. Based on preliminary data, this protein could also be crucial for other developmental processes, as the progeny of knock-out mutants is not viable.

The aim of this thesis is to elucidate the function of AtPhLP2 in *Arabidopsis thaliana* root development by analyzing the expression of PhLP2 and characterizing the *phlp2* knock-down line. I prepared transgenic *Arabidopsis thaliana* lines to monitor the activity of the putative PhLP2 promoter. The promoter was active in the aboveground parts of the plant as well as in the vascular bundles of the root and in the root meristem. The localization of the protein was consistent with promoter activity, and strong expression was additionally observed in germinating pollen. At the cellular level, the signal was visible in the nucleus and cytoplasm. To estimate a possible link to auxin signaling and other processes in which PhLP2 might be involved, I characterized the phenotype of *phlp2* knock-down lines available in the laboratory and quantified the general growth characteristics and responses of these seedlings to gravistimulation or IAA treatment. I show that the PhLP2 knock-down line exhibited severe root waving, a short meristem and minimal number of lateral root primordia, yet there was no insensitivity to IAA observed and the rapid auxin response was not impaired. The distinct phenotypic expression of the knock-down mutant cannot be explained by disruption of auxin signaling, and further research is needed to unravel the function of PhLP2 in *Arabidopsis thaliana* development.

Keywords: phosducin-like 2, rapid auxin response, phosphorylation, root development