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The cytokinin status influences phytochrome-dependent seed germination in *Arabidopsis thaliana*

Seed germination is of crucial importance for a plant's life history as it determines the reproductive success of the progeny generation. Besides external cues as light environment, temperature and water availability also internal cues such as genetic parameters, parental nutrition status and phytohormones are known to influence germination. While the role of phytohormones like ABA and GA in germination has been studied extensively, the functional role of cytokinins in germination has been investigated rarely.

In my research project, we found that *Arabidopsis thaliana* seeds with a lowered cytokinin content, which is due to the overexpression of cytokinin oxidase/dehydrogenase genes or seeds with an impaired cytokinin signal transduction, showed dramatically increased light sensitivity in the phyA-mediated 'very low fluence response' (VLFR) as compared to wild type seeds.

For the perception of very low fluence light, the phytochrome A dependent signal transduction pathway is important in cytokinin receptor mutant seeds, as verified in germination assays using *phyA ahk2 ahk3* triple mutants seeds.

Gene expression analysis showed elevated *PHYA* gene expression levels in cytokinin receptor double mutant seeds compared to wildtype seeds. These findings might lead to the conclusion, that phyA is specifically relevant for the observed germination phenotype of cytokinin receptor double mutant seeds in very low fluence light conditions.

Parental, especially maternal, effects were known to influence the germination behaviour of its progeny. In reciprocal crosses, seeds derived from maternal plants impaired in cytokinin signal transduction showed elevated germination rates in VLFR conditions compared to seeds derived from wildtype maternal plants. Therefore, the analysis of the mechanism of action of cytokinin in regulating VLFR in seed germination is part of our ongoing research.