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Mutant *A. thaliana* (right) Exhibits Excess Root Elongation

Identifying Novel Cytokinin Signaling Components by a Second-Site Modifier Mutation Screen in *Arabidopsis thaliana*

The plant hormone cytokinin is involved in shoot and root elongation, leaf senescence, cell division, and other developmental and physiological processes. Cytokinin is part of a histidine-to-aspartic acid phosphorelay signaling system. It is the ligand for histidine kinase receptors that phosphorylate *Arabidopsis* histidine phosphotransfer proteins (AHPs), which in turn transfer the added phosphate group to response regulators. In order to identify novel components, such as phosphatases and cytokinin transporters, involved in cytokinin signaling, a second-site modifier mutation screen in a sensitized background (*ahp2;ahp3* double mutant) is being conducted. Loss-of-function *ahp2;ahp3* plants exhibit wild-type-level sensitivity to cytokinin in a root elongation assay. However, even minor alterations in cytokinin signaling can produce substantial phenotypic changes that would not otherwise be observable in a wild-type background, most notably a longer root length in the presence of exogenous cytokinin. The progeny of approximately 15,000 first generation mutant plants were assayed for altered response to cytokinin, and putative cytokinin signaling-mutant lines are currently being confirmed. Future work will include characterization and mapping of causative mutations in confirmed mutant lines. Identification of new components of cytokinin signaling can help improve crop yield in the future since genetic modification of cytokinin signaling increases maize and rice yield.