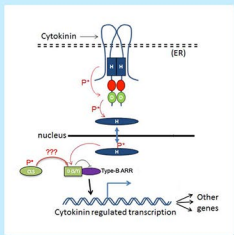




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Cytokinin signaling cascade

### Determining the Role of CLS Genes in the Cytokinin Signaling Pathway in *Arabidopsis thaliana*

Cytokinin is a plant hormone involved in a wide variety of plant growth processes. The cytokinin signaling pathway involves a multi-component phosphorelay that ends with phosphorylation of the aspartic acid of the type-B response regulators (ARRs). Recent studies, which used Ser/Thr phosphomimics in the ARR receiver domain, have suggested that cytokinin signaling can activate type-B ARR's via phosphorylation of Ser/Thr residues rather than through the canonical aspartic acid residue. Constitutive triple response 1 (CTR1) is a serine/threonine (Ser/Thr) kinase in *Arabidopsis thaliana* that has several paralogs with unknown function, which we have termed CTR1-like sequences (CLS genes). We hypothesize that the CLS genes encode Ser/Thr kinases that phosphorylate the type-B ARR's in the cytokinin signaling pathway. We created mutants of these CLS genes via the CRISPR-Cas9 system or T-DNA insertion. We have confirmed putative mutant plant lines for 7 out of 9 of the CLS genes that we are studying. To determine if the CLS mutants play a role in the cytokinin signaling pathway, we will measure root elongation in response to cytokinin. Determining the functions of these genes may help us better understand the cytokinin signaling pathway in plants, which may provide new strategies to engineer this signaling pathway to modify various agricultural traits to meet the future food supply demands.