

Regulation of stomatal development by ERECTA-family receptor kinases

Jin Suk Lee

Department of Biology, Concordia University

Stomatal function is critical for plant productivity and survival and as such, stomatal development is tightly controlled by various endogenous and environmental signals. Three cell surface ERECTA-family receptor kinases, ERECTA, ERL1, and ERL2, perceive signals and interact synergistically to coordinate stomatal patterning and differentiation. While we know the distinct function of ERECTA and ERL1 receptors at different stages of stomatal development in *Arabidopsis*, ERL2's specific function and biochemical interactions with other stomatal receptors and ligands remain unknown. Using a combination of genetic, biochemical, and microscopy-based approaches, we discovered that ERL2 receptor acts in the later stage of stomatal development to specify stomatal differentiation. We also found that ERECTA-family receptors in the core stomatal developmental pathway is the integration point of multiple signals for fine-tuning proper stomatal density and patterning in changing environment. Combined, our work will expand the knowledge of plant receptor signaling and provide insight into the molecular basis of signal integration during stomatal development.