Category: Abiotic: Light

1100-058 - Ultraviolet-B induced phototropism in Arabidopsis seedlings and inflorescence stems

Tuesday, Jul 17 1:30 PM – 3:00 PM

Ultraviolet-B radiation (UV-B - 280-315nm) was only recently described as a phototropism-inducing type of radiation. We have identified that phototropic growth towards UV-B of Arabidopsis hypocotyls and inflorescence stems are both regulated by the same photoreceptor [illegible]y a shift in dominance during plant development. The phototropin pathway is dominant in etiolated seedlings (Vanhaelewyn et al., 2016a), while the UVR8 pathway is predominant in inflorescence stems. The role of key-players in the UVR8 pathway, such as HY5 and HYH has been evaluated for their importance in this phototropic response. Unilaterally UV-B irradiated inflorescence stem tissue demonstrates a lateral UVR8-mediated signal gradient. In addition, the function of UVR8 in different cell types was validated by use of cell type specific complementation lines of UVR8 in a *uvr8-6* mutant background. This reveals that UVR8 signaling is important in various cell types within the inflorescence stem. As UV-B is known to affect plant hormones (Vanhaelewyn et al., 2016b), we investigated their involvement in this phototropic response. By means of reporter line analysis, mutant analysis, gene expression assays and pharmacological assays, we designate a role for both gibberellins and auxins to UV-B induced phototropism of Arabidopsis inflorescence stems. These combined data provide a mechanistic framework for UV-B induced phototropism.

References

Vanhaelewyn L, Schumacher P, Poelman D, Fankhauser C, Van Der Straeten D and Vandenbussche F (2016a) REPRESSOR OF ULTRAVIOLET-B PHOTOMORPHOGENESIS function allows efficient phototropin mediated ultraviolet-B phototropism in etiolated seedlings. Plant Sci 252:215-221

Vanhaelewyn L, Prinsen E, Van Der Straeten D, Vandenbussche F (2016b) Hormone-controlled UV-B responses in plants. J Exp Bot 2016 67:4469-4482

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