

MCB PLANT BIOLOGY SEMINAR SERIES F2009

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“Regulations of abscisic acid metabolism”

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ABSTRACT:

Abscisic acid (ABA) regulates plant's responses to abiotic and biotic stresses. The ABA level is regulated by a balance of the biosynthesis and catabolism, and its metabolic pathway responds to changing water status, such as seed imbibition, dehydration, submergence, and changes in humidity. Nine-cis-epoxycarotenoid dioxygenase (NCED) catalyzes a rate-limiting step in ABA biosynthesis, whereas ABA 8'-hydroxylase (CYP707A) is a regulatory step to inactivate ABA. My research team investigates how these are regulated in response to changing environment. In Arabidopsis, drought stress induces ABA synthesis. Immunohistochemical analysis revealed that drought-induced NCED3 accumulation occurs in vascular parenchyma cells. Also, other ABA biosynthesis enzymes, AtABA2 and AAO3, are predominantly localized in the same cell types regardless of plants are stressed or not. RT-PCR expression analysis on laser-micro-dissected cells showed that many of ABA-induced genes were first activated in vascular tissues, and then in mesophyll tissues thereafter. These indicate that drought responses are systemic and spatially constraint ABA synthesis in vascular tissues contributes to the pattern of systemic induction.

Contact Derek Bewley (dbewley@uoguelph.ca) should you wish to meet with the seminar speaker