

Saturday, October 10, 10:55-11:45 a.m.

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Landscape ionomics: The functional genomics of ecologically adaptive ionic variation

Genome-wide association (GWA) mapping using wild-collected *Arabidopsis thaliana* is starting to identify the genetic architecture and molecular mechanisms underlying natural variation in the capacity of *A. thaliana* to accumulate from the soil mineral nutrients and trace elements (*aka* ionic variation). Furthermore, association of the loci controlling variation in the ionome with soil features across the landscape is suggesting ecological functions for this natural ionic variation. Parallel studies on standing populations of *A. thaliana* in Catalonia, Spain, coupled with common garden experiments in the field in the same region, are revealing the existence of locally adapted populations over short geographical distances (~30 km). These field studies are also identifying a potentially adaptive role for the ionic variation identified by GWA mapping. The genes and types of polymorphisms controlling natural ionic variation in *A. thaliana* appear to be conserved in crops, raising the possibility of a robust 'Darwin to Borlaug' translational pipeline between functional natural variations in *A. thaliana* and crops.