

# GENETICS AND FUNCTIONAL GENOMICS OF ABSCISSION

Chad Niederhuth

Dr. John C. Walker, Dissertation Supervisor

## ABSTRACT

Abscission is the shedding of plant organs as part of development or in response to environmental stresses. In the model plant *Arabidopsis thaliana*, only the floral organs abscise as part of development. This is controlled by two functionally redundant receptor-like kinases HAESA (HAE) and HAESA-LIKE 2 (HSL2), their putative ligand INFLORESCENCE DEFICIENT IN ABSCISSION (IDA), the MAP-Kinase Kinases MKK4 and MKK5, and the MAP-Kinases MPK3 and MPK6. Two mutant screens, were conducted to identify new genes involved in abscission. In the first, EMS mutagenesis was used to find abscission defective mutants. In the second, activation tagging was used to find suppressors of the *hae hsl2* abscission defective mutant. To find targets of HAE HSL2-signaling, the transcriptomes of floral receptacles from wild type plants and *hae hsl2* mutants were compared by RNA-seq, showing *HAE HSL2*-dependent processes. Comparison of this data to microarrays from different developmental stages of wild type abscission zones revealed a set of *HAE HSL2*-independent processes that occur during abscission. Promoter regions were analyzed to identify putative transcription factors regulating the *HAE HSL2*-dependent processes.

