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## Potential targets of VIVIPAROUS1/ABI3-LIKE1 (*VAL1*) repression in developing *Arabidopsis thaliana* embryos

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Seed development and metabolism in *Arabidopsis* are regulated by leafy cotyledon1 (LEC1), Abscisic acid-insensitive3 (ABI3), Fusca3 (FUS3) and LEC2. These transcription factors are part of the core LAFL (LEC1, ABI3, FUS3, and LEC2) regulatory network central to seed development. The action of the LAFL transcription factors is inhibited in germinating seedlings by *VAL1* and 2 to suppress the embryonic program during the transition from the embryonic to vegetative state. However, the VALs are also expressed in maturing seed, which appears controversial, considering their role in suppressing the embryonic program. Two *VAL1* splice variants were identified through RNA sequencing in developing *Arabidopsis* embryos: A full-length form containing four domains known to be involved in transcriptional and/or epigenetic regulation and a truncated form lacking the plant-homeodomain-like domain associated with epigenetic repression. Reverse genetics revealed limited influence of the *VAL1* absence on seed and embryo metabolomes. However, 3,293 and 2,194 transcripts were up and down-regulated, respectively, in developing *val1* mutant embryos relative to the wild type, suggesting that *VAL1* is a global regulator of gene expression in developing embryos. Interestingly, none of the transcripts encoding the core LAFL network transcription factors were affected in *val1* embryos. Instead, activation of *VAL1* by FUS3 appears to result in repression of a subset of seed maturation genes downstream of core LAFL regulators. Transcripts that were not LAFL targets were also de-repressed in developing *val1* embryos. Taken together, *VAL1* appears to repress its targets through LAFL-dependent and independent mechanisms through epigenetic and/or transcriptional regulation.

### Biography

Eva Collakova has obtained her PhD in 2003 from Michigan State University, where she has also completed her Postdoctoral studies. In 2009, she became an Assistant Professor at Virginia Tech, USA. She is currently an Associate Professor at the Department of Plant Pathology, Physiology and Weed Science at Virginia Tech. She has published over 20 manuscripts in peer-reviewed journals, including top plant research-related journals, e.g., *Plant Cell*, *Plant Physiology* and *Plant Journal* and has served as a Reviewer of over 25 manuscripts for international journals and as a Panelist and an ad-hoc Reviewer for Federal Grant Agencies in the US.

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