

P37 – Basal defense - variations in the EDS1 promoters of *Vitis vinifera* cv. ‘Cabernet Sauvignon’ and *V. aestivalis* cv. ‘Norton’ may define specific EDS1 expression pattern and influence associated salicylic acid signaling

Hagemann, Michael H.¹; Sprich, Elke¹; Winterhagen, Patrick^{2*}

¹University of Hohenheim, Institute of Crop Science (340f), Stuttgart, Germany

²DLR Rheinpfalz, Institute of Plant Protection, Neustadt/Weinstraße, German

*patrick.winterhagen@dlr.rlp.de

Abstract

In grapevine, the defense regulator *ENHANCED DISEASE SUSCEPTIBILITY (EDS)* is present as a multi-member gene family and plays a role in basal defense in plants. *EDS1* is highly conserved and functional in both, *Vitis vinifera* cv. ‘Cabernet Sauvignon’ and *Vitis aestivalis* cv. ‘Norton’; hence, the regulation of *EDS1* - regarding tissue specificity and transcript level - may be a key for powdery mildew (PM) resistance in cv. ‘Norton’, while cv. ‘Cabernet Sauvignon’ is susceptible. Besides PM resistance, also salicylic acid (SA) signaling and the degree of accumulation in leaves is thought to be associated with *EDS1* expression. By preliminary analysis the SA content was determined in leaves of several resistant and susceptible accessions from both species, *V. vinifera* and *V. aestivalis*, which corroborates a tendency that SA accumulation and PM resistance may be linked. Further, the putative promoter sequences of the *EDS1* genes (pEDS1) from cv. ‘Cabernet Sauvignon’ and cv. ‘Norton’ were bioinformatically analyzed with the Genomatix software suite to predict transcription factor binding sites (TFBS) and higher order regulatory models. The analysis revealed that the promoter sequences contain some conserved but also highly variable regions as well as a different set of TFBS and regulatory models. In pEDS1 from cv. ‘Cabernet Sauvignon’ higher order models containing AHBP, DOFF, L1BX, MYBL, OPAQ and WRKY motifs are predicted. In contrast, in pEDS1 from cv. ‘Norton’ other putative models are present containing OPAQ and DOFF motifs only. The variations within the regulatory regions of pEDS1 are presumably responsible for specific *EDS1* expression and associated SA signaling.

Keywords: powdery mildew resistance, *EDS1* gene regulation, transcription factor binding sites, salicylic acid