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Poster Communication Abstract – 6.25

ELUCIDATING THE DISTINCT ROLE OF THE GRAPEVINE PARALOGS VVEPFL9-1 AND VVEPFL9-2 IN THE REGULATION OF STOMATAL FORMATION

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Stomata are microscopic pores mainly located in leaf epidermis where gas exchanges between plants and atmosphere take place. Stomatal initiation is under the control of the transcription factor SPEECHLESS which is highly regulated by many mechanisms. The primary pathway is the one relying on a MAP kinase cascade controlled by Epidermal Patterning Factors (EPF and EPF-Like), a class of small cysteine-rich signaling peptides. While EPF1 and EPF2 induce the inhibition of SPEECHLESS, EPFL9 stabilizes it, leading to stomatal formation. In grapevine, there are two paralogs for EPFL9, VvEPFL9-1 and VvEPFL9-2, sharing 82% identity at protein level in the mature C-terminal functional domain.

In a previous study, the role of VvEPFL9-1 in determining the basal set of stomata in very young leaves has been demonstrated. However, despite their structural similarity, whether the two isoforms are differentially regulated and whether they have distinct roles remain to be elucidated. In our study we showed that while VvEPFL9-1 is expressed only in the developing leaf in the apex, VvEPFL9-2 is expressed both in the apex and in mature leaves along plant axis. Moreover, we showed that the expression of VvEPFL9-2 in leaf is significantly repressed by ABA.

In addition, the application of targeted mutagenesis and overexpression strategies in different grapevine varieties to draw a precise picture of VvEPFL9-1 and VvEPFL9-2 specific function is in progress. Our results

suggest that VvEPFL9 paralogs may have distinct activities and that VvEPFL9-2, sensitive to ABA/drought signals, may contribute to determine stomatal plasticity during leaf growth.