# The Basic Leucin-Zipper factor VvBZIP6 is involved in the regulation of the flavonoid pathway in grapevine

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In grapevine (*Vitis vinifera* L.) flavonoids compose one of the most abundant subgroups of secondary metabolites. They accumulate preferentially in the skin and seeds of grapes and fulfill several important functions: i) they mediate the response to biotic and abiotic stresses(temperature, UV-light, nutrition, water deficit); ii) they provide pigmentation to flowers and fruits, thereby influencing quality and typicity of wines. They have been also associated to the observed health-promoting effects ascribed to grape rich diet including wine.
The biosynthesis of these compounds is mainly regulated at the transcriptional level by controlling the genes of the so called general flavonoid pathway which has been genetically and biochemically elucidated in several species including grapevine. Regulation of the structural genes of the pathway is however still not completely elucidated.
In this study we report the characterization of one of the 55 predicted grapevine bZIP genes, *VvbZIP6*, to be involved in flavonoid biosynthesis regulation. Analysis of its expression during Pinot Noir development revealed that this transcript is very abundant at flowering time concomitantly with the peak of the flavonols quercetin and kaemperol. Chardonnay leaves exposed to UV-light showed an induction of *VvbZIP6* within the first 10 h, followed by the accumulation of flavonols at 24 h post treatment. The overexpression of *VvbZIP6* in tobacco transgenic lines positively correlates with the flower content of flavonol compounds such as quercetin and kampferol but also glycosilated cyanidin and proanthocyanidins pointed towards a role as a general regulator of the grapevine flavonoid pathway. This has been confirmed by luciferase reporter-assays in Chardonnay suspension cultures showing that VvbZIP6 induces the promoters of *VvCHS, VvFLS1, VvANR* genes likely via interaction with other co-factors.

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