Proceedings of the Joint Meeting AGI-SIBV-SIGA
Assisi, Italy – 19/22 September, 2011
ISBN **978-88-904570-2-9**

Poster/Oral Communication Abstract –

ROLE OF VvMYB14, A NOVEL R2R3 MYB FACTOR, IN THE WOUND RESPONSE AND IN THE REGULATION OF STILBENE BIOSYNTHESIS IN GRAPEVINE

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Stilbene synthases, R2R3 MYB, downy mildew, abiotic stresses

Stilbene synthases (STSs) are a class of enzymes belonging to the general CHS type III polyketide synthase family involved in the last step of the biosynthesis of stilbenes. These enzymes, and their main products resveratrol or pynosylvin are detectable in only a limited number of unrelated plant species, including grape, and accumulate in response to biotic and abiotic stresses. Despite numerous studies that have been performed on the accumulation, metabolism and biological properties of resveratrol, little is known about the transcriptional regulation of this pathway. As reported in a previous contribution, based on a whole transcriptome sequencing by mean of next generation sequencies thechnology (NGS), we identified a candidate R2R3-MYB transcription factor (TF) which shows an expression pattern similar to that observed for STSs and which could be involved in the regulation of stilbene biosynthesis in grape. This R2R3 MYB factor was designated as *VvMYB14*, based on homology with the *AtMYB14* R2R3 MYB factor. Analysis of *VvMYB14* expression in grape leaf discs treated with biotic (downy mildew infection) and abiotic stresses (wounding and UV-C exposure) known to be involved in the transcriptional activation of *STS* genes, showed a close correlation between the pattern and timing of expression of selected *STS* genes and TF. Using a Dual Luciferase Reporter Assay System in transiently transformed grapevine cells, this TF demonstrated to increase stilbene synthase promoter activity.

Here we present the next steps in the characterization of *VvMYB14*. We focused our attention on the wound response extending the expression analysis also to the other R2R3 MYB TFs known to be involved in the regulation of the flavonoid synthesis. Furthermore we report the first results confirming *in planta* the role of *VvMYB14* as a *VvSTS* trans-activator. We developed a transgenic grapevine hairy root system for testing the effect of both silencing and over-expression of *VvMYB14* on the response of *VvSTS* expression. Preliminary results indicate that roots in which *VvMYB14* has been silenced, show significantly reduced levels of *VvSTS* transcription following the application of the wound stress. Further experiments are now underway to clarify the role of VvMYB14 in the regulation of both the stilbene synthase pathway and genes belonging to the general phenylpropanoid pathway in grapevine.