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Poster Communication Abstract – 1.26

ASSESSING ANTHOCYANIN DEGRADATION IN ELICITOR-TREATED POTATO CELL CULTURES

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Anthocyanins are natural pigments raising a multidisciplinary scientific interest due to their extensive range of colors and their relevant role against chronic human pathologies. Anthocyanin turnover contributes to the final amount of these pigments that can be accumulated in plant and *in vitro* cultures. Nevertheless, little is known about anthocyanin catabolism in plant cells in contrast to the extensive knowledge regarding their biosynthesis. In the current work, we investigated potato anthocyanin turnover to identify enzymes and by-products of the catabolic process. To pursue this aim, we used cell cultures of the common potato (*Solanum tuberosum*, cultivar Blue Star) treated with different elicitors that could trigger or repress anthocyanin degradation. Experiments were conducted using wild-type and edited cell cultures obtained through knock-out of *StISAC*, a target gene encoding for a negative R3-MYB regulator of anthocyanin biosynthesis. Cell cultures were subjected to heat –an established stress factor that reduces anthocyanin production – and elicitors having either a strong antioxidant activity (L-ascorbic acid) or inhibiting the activity of POD (salicylhydroxamic acid and potassium iodide). Through spectrophotometric analysis, we observed that elicitors had a significant impact not only on anthocyanin concentration but also on the percentage of polymeric color, highlighting the constitution of co-pigment complexes, especially in wild-type calli. This hypothesis was further confirmed by *in vitro* assays to evaluate the antioxidant activity.

Summing up the results, it can be concluded that calli in which the editing has impaired *StISAC* function showed higher anthocyanin stability and limited POD activity. We are currently validating the role of POD in anthocyanin degradation in a heterologous system (tobacco), comparing plants overexpressing *StISAC* and *35S::AN1*.