

Title Amounts and subcellular localization of stilbene synthase in response of grape berries to UV irradiation

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Abstract

Stilbene synthase (STS) is a pivotal enzyme that catalyzes the biosynthesis of resveratrol and is known to be induced by ultraviolet (UV) irradiation. However, it remains at present unclear about the response of STS to UV radiation at protein level and at subcellular distribution. Here, changes of amounts and subcellular localization of STS in developing grape berries exposure to UV irradiation were investigated using a polyclonal antibody raised against grape berry STS. The analyses of Western blot revealed that the UV-induced increase in STS amount is developmental stage-dependent and time course-dependent, with response of STS being postponed concomitantly with the progressive development of berry. The immuno-localization via immunogold electron microscopy showed that, on one hand, STS was mainly located on the cell wall, secondary cell wall and chloroplast of the skin tissues during berry development, with only a few particles representing STS present under natural conditions; and on the other hand, STS particles increased when exposure to UV, particularly on the cell wall, the secondary cell wall and chloroplast, while such increase was also developmental stage-dependent. It is thus suggested that the increased STS on the cell wall might be related to grape berry defense against UV irradiation.