

# On the mechanism of dormancy release in grapevine buds: A comparative study between hydrogen cyanamide and sodium azide

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Sodium azide ( $\text{NaN}_3$ ), a well-known inhibitor of mitochondrial respiration, stimulated bud-dormancy release in grapevines similar to hydrogen cyanamide (HC), while HC, a well-known dormancy release agent, inhibited the  $\text{O}_2$  uptake in isolated grape bud mitochondria similarly to  $\text{NaN}_3$ .

Additionally, both chemicals induced transcript expression of the antioxidative enzyme glutathione reductase and glucose- 6-phosphate-dehydrogenase (G6PD), therefore upregulated the ascorbate-glutathione cycle (AGC) and the pentose phosphate pathway, respectively. As a result of AGC activation, the ratio of reduced to oxidized glutathione (GSH/GSSG) increased. Both stimuli also upregulated the transcription of 1,3- $\beta$ -D-glucanase, a key enzyme in dormancy release.

Together, these data support mechanistic connection between impaired Mit function and dormancy release, and suggests that as a consequence of  $\text{O}_2$  deprivation, increases in glycolysis and in ethanolic fermentation could be responsible for activation of d