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## Exogenous nitric oxide application results in the modification of the antioxidant status of *Medicago truncatula* plants

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Nitric oxide (NO) is a bioactive molecule involved in numerous biological events that has been reported to display both prooxidant and antioxidant properties in plants. Several reports exist which demonstrate the protective action of sodium nitroprusside (SNP), a NO donor [1], which acts as a signal molecule in plants responsible for the regulation of the expression of many antioxidant enzymes. Preliminary analyses were carried out in order to determine the optimal method of SNP application. This study subsequently attempted to provide novel insight into the effect of application of low (100 $\mu$ M) and high (2.5mM) concentrations of SNP on mature (40 day) and senescing (65 day) *Medicago truncatula* plants following a combined physiological, biochemical and molecular approach. Higher concentrations of SNP resulted in increased cellular damage levels, reactive oxygen species (ROS) concentration and polyamine content, further induced in older tissues. Quantitative real-time PCR data examining antioxidant gene expression levels suggest that low concentration of exogenous NO applied in mature leaves leads to an overall induction of antioxidant gene expression, while increasing concentration results in suppression of these genes. Conversely, older plants demonstrate a much more variable regulation which appears to be time-dependent. Overall, senescing *M. truncatula* plants demonstrated greater sensitivity to NO-induced oxidative damage, suggesting a developmental stage-dependent suppression in the plant's capacity to cope with free oxygen and nitrogen radicals.

### References

[1] Tanou *et al.* (2009). *Plant J* **60**, 795–804.

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