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Nitric oxide production mediates oligogalacturonides-triggered immunity and resistance to *Botrytis cinerea* in *Arabidopsis thaliana*

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Abstract : In this study, we investigated the production and/or function of NO in *Arabidopsis thaliana* leaf discs and plants elicited by oligogalacturonides (OGs) and challenged with *Botrytis cinerea*. We provided evidence that OGs triggered a fast and long lasting NO production which was Ca²⁺-dependent and involved nitrate reductase (NR). Accordingly, OGs triggered an increase of both NR activity and transcripts accumulation. NO production was also sensitive to the mammalian nitric oxide synthase inhibitor L-NAME. Intriguingly, we showed that L-NAME affected NO production by interfering with NR activity, thus questioning the mechanisms of how this compound impairs NO synthesis in plants. Using candidate genes and transcriptomic approaches, we further demonstrated that NO participates to the regulation of genes induced by OGs such as genes encoding disease related proteins and transcription factors. The over-representation of certain regulatory elements in promoter sequences of target genes also suggests the involvement of specific transcription factors in the NO response. Mutant plants impaired in several selected NO responsive genes, as well as Col-0 plants treated with the NO scavenger cPTIO, were more susceptible to *Botrytis cinerea*. Taken together, our investigation deciphers part of the mechanisms linking NO production, NO-induced effects and basal resistance to *B. cinerea*.

Keywords: nitric oxide, oligogalacturonides, nitrate reductase, plant defense, *Arabidopsis thaliana*, *Botrytis cinerea*, calcium.