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# Nitric Oxide Synthase in plants: the surprise from algae

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Highlights

- Nitric oxide synthases (NOSs) are absent in land plants but are present in several algal species
- Weisslocker-Schaetzel *et al*. (Plant Science, 265, 100-111, 2017) reported the first in depth structural and functional analysis of an algal NOS
- The NOS from the green algal *Ostreococcus tauri* displays unexpected enzymatic properties

**Abstract**

Nitric oxide (NO) is a key signalling molecule involved in various plant physiological processes. Recent investigations showed that nitric oxide synthase (NOS), the main enzymatic source for NO in animals, is absent in land plants but present in several algal species including the green algal *Ostreococcus tauri*. In a recent issue of Plant Science, Weisslocker-Schaetzel *et al*. reported the in depth structural and functional analysis of OtNOS using a combination of phylogenetic, structural, spectroscopic and biochemical approaches. Their investigation highlights that OtNOS is a prototype of highly performant NOSs, producing NO as a yet unseen rate. Also, this original work opens new opportunities for research investigating the structure/function of members of this family, the physiology and ecology of algae and, more generally, the evolution of NO signalling.

Keywords: algae; nitric oxide; nitric oxide synthase

## 1. A brief history of the search for nitric oxide synthase in plants

Nitric oxide (NO) is a free radical gas that functions in a broad range of plant physiological processes such as root and pollen tube tip growth, stomatal closure, flowering, senescence, iron homeostasis, immunity, symbiosis and responses to various abiotic stresses [1]. The exact cellular role of NO is less