

P030 The Role of Denitrification in Nitrite and Nitric Oxide Detoxification in Soybean Nodules
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Bradyrhizobium japonicum is able to reduce nitrate to dinitrogen through the process of denitrification, both in free-living conditions and when associated symbiotically with soybean plants. Two of the enzymes active within this process, nitrite reductase (encoded by *nirK*) and nitric oxide reductase (encoded by *norCBQD*) may also function in nitrite and nitric oxide (NO) detoxification, respectively. Maximal induction of the denitrification pathway is observed in bacteroids isolated from nodules of plants treated with nitrate and subjected to anoxic conditions before nodule harvesting. Under such conditions, nodules from plants inoculated with a *nirK*⁻ mutant strain showed a decrease in functional leghemoglobin accompanied by an increase in nitrite accumulation and nitrosylleghemoglobin, as shown by electron paramagnetic resonance. However, nodules from plants inoculated with a *norC*⁻ mutant strain showed a wild-type phenotype with regards to the amount of functional leghemoglobin and nitrosylleghemoglobin present in the nodule, and to the ability of the bacteroids to consume NO. These results demonstrate that NirK may play a role in nitrite detoxification, but Nor is not solely responsible for NO detoxification.