

P041 From Nitrite Binding to Nitric Oxide release;
the first turnover of cytochrome cd_1
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Denitrification is the process in which nitrate is sequentially reduced via nitrite, NO and N_2O to nitrogen gas. The committed step in terms of loss of terrestrial nitrogen is reduction of the nitrite anion to gaseous NO; a reaction catalysed by the enzyme known as cytochrome cd_1 , which performs the one electron reduction of nitrite to nitric oxide. *Paracoccus pantotrophus* cyt cd_1 is a dimer, each monomer contains one c haem centre, which accepts electrons from partner donor proteins, and one specialized d_1 haem in the active site. Studies using physiological electron donor proteins to *P. pantotrophus* cyt cd_1 with various electron acceptors have shown that the fully oxidized "as isolated" conformer of the enzyme is not catalytically competent. This conformer can be reduced chemically, to yield a catalytically active state, which when re-oxidized with an alternate substrate such as hydroxylamine remains catalytically competent. However, unless stabilized by a bound nitrite ion at the active site, this activated all ferric state rapidly decays to the inactive "as isolated" state. We report experiments in which we study the reaction of the nitrite bound all-ferric form of the cyt cd_1 with Fe(II) cytochrome c in an attempt to determine the events at the d_1 haem associated with the first turnover of the enzyme.