

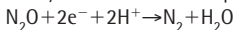
**P004** Reactions of *Paracoccus pantotrophus* N<sub>2</sub>O reductase with cytochrome c.  
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The Nitrous Oxide Reductase (N<sub>2</sub>OR) of *Paracoccus pantotrophus* catalyses the terminal step of denitrification:



Investigations of the structure of the dimeric N<sub>2</sub>OR suggest the existence of inter-subunit electron transfer pathways between the binuclear Cu<sub>A</sub> site of one subunit and the μ<sub>4</sub>-sulphide-bridged tetra-nuclear Cu<sub>Z</sub> active site of the other subunit, within the functional dimer, which are 10<sup>9</sup> more efficient than the intra-subunit exchange pathways. Rapid mixing experiments using cytochrome c as a redox partner for N<sub>2</sub>OR have allowed us to determine the rate constants associated with a number of the steps in the electron transfer mechanism of this enzyme and to develop a model of the catalytic cycle. Our data suggest that it is the cytochrome c-N<sub>2</sub>OR complex, formed prior to electron transfer to the Cu<sub>A</sub> centre, which is the kinetically relevant species as, remarkably, in the absence of cytochrome c the fully reduced enzyme shows only minimal reactivity with N<sub>2</sub>O. Numerical simulations of single turnover experiments closely match experimentally observed time courses,