

P024 Current thoughts on bacterial nitrate reductases:

The voltammetric characterisation of NapAB from *Paracoccus pantotrophus*.

Gates, A.J.[¶], Richardson, D.J.[§], Butt, J.N.

CMSB, University of East Anglia, School of [¶]Chemical and [§]Biological Sciences.

Nitrate reductases play a variety of roles in bacteria. Their reduction of nitrate to nitrite can be coupled to the generation of proton motive force, driving energy conservation via ATP synthase, during anaerobiosis. This aspect of nitrate reduction is performed by the membrane bound enzyme NarGHI. Alternatively under aerobic conditions periplasmic nitrate reductases are able to dissipate excess reducing equivalents that are derived from the oxidation of highly reduced carbon sources. The periplasmic nitrate reductase from *Paracoccus pantotrophus* is a soluble dimeric enzyme. The holoenzyme is composed of a 90 kDa catalytic subunit, NapA, which binds the Mo[MGD]₂ cofactor and an N-terminal [4Fe-4S] cluster, and a 16 kDa diheme cytochrome c electron transfer component, NapB. Protein film voltammetry has been employed to probe the redox properties and catalytic mechanism of NapAB, with both catalytic and non-turnover responses having been observed. A comparison of the nitrate reducing properties of the *P. pantotrophus* enzymes NapAB and NarGHI will be presented.