

P034 Nitrate reduction in the periplasm of *Escherichia coli*
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Nitrate is a widely used and readily available source of inorganic nitrogen for plants and microorganisms in nature. Fixed inorganic nitrogen is mainly supplied to natural environments either from human agricultural or industrial activities or from biological nitrogen fixation. Most of it is converted to nitrate by nitrifying bacteria and the nitrate then serves as a nitrogen source for assimilation or as a respiratory electron acceptor. Bacterial nitrate reductases are molybdoenzymes that can catalyse the 2-electron reduction of nitrate to nitrite and can be classified according to their localization and function. Periplasmic nitrate reductases are linked to electron transport chains and have different functions in bacteria including, the disposal of reducing equivalents during anaerobic growth and nitrate respiration in nitrate-limited environments. In periplasmic nitrate reductases, electrons are passed through one or two cytochrome *c*-containing subunits to the catalytic subunit NapA, that commonly contains *bis*-MGD and a [4Fe-4S] cluster. This study reports on the biochemical properties of purified NapA from *E.coli* and its redox partner NapB, a di-heme *c*-type cytochrome. The redox potentials at which the [4Fe-4S] cluster and the *bis*MGD operate as well as the redox properties of the hemes of NapB have been revealed by spectropotentiometric analysis. The structure of NapA has also been solved to 2.5 Å and reveals the co-ordination around the Mo moiety and together with the redox properties of the cofactors glean insights into the model of nitrate reduction in the periplasm of *E.coli*.