

**P043** Micro-aerobic denitrification in *Neisseria meningitidis*.  
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The major aetiological agent of human bacterial meningitis is *Neisseria meningitidis*. During the course of disease and host colonisation the bacterium has to withstand limited oxygen availability. Nitrogen oxide and nitrogen oxyanions are thought to be present which may constitute an alternative sink for electrons from the *N.meningitidis* respiratory chain. A partial denitrification pathway is encoded by the *aniA* nitrite reductase gene and the *norB* nitric oxide reductase gene. Analysis of *aniA* expression indicates it to be controlled by oxygen and nitrite availability via FNR and NarQP. The ability of *N.meningitidis* to denitrify relies on microaerobic growth conditions. Analysis of oxygen, nitrite and nitric oxide (NO) concentrations reveals multiple corresponding phases of reduction and NO production. Oxygen depletion signals AniA expression, which produces NO. NO accumulation inhibits oxidase activity causing a temporal increase in oxygen availability. NO reductase is expressed which reduces NO and allows the restoration of oxidase activity. The resulting decrease in oxygen concentration allows further denitrification to occur. After the initial Nitrosative insult produced by the NO burst, recovery of bacterial growth is poor when highly oxygenated. Denitrification however allows rapid recovery and growth of cultures under microaerobic conditions. This counter-intuitive observation demonstrates the importance of denitrification for Neisserial growth, highlighting the fine balance of life at the oxic/anoxic interface.