

P028 Phylogenetic markers for the assessment of ammonium oxidizing bacteria: *hao/hzo* versus *amoA* and 16S rRNA
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Aerobic ammonia oxidation (aao; ammonia is oxidized to nitrite) and anaerobic ammonium oxidation (anammox; ammonium and nitrite are combined to dinitrogen gas) are performed by different organisms. While *Beta-* and *Gammaproteobacteria* are responsible for aao, anammox is a physiological trait of a distinct group within the *Planctomycetes*. The enzyme systems involved in both processes differ significantly. However, the hydroxylamine oxidoreductase (Hao) of *aao* bacteria and hydrazine oxidoreductase (Hzo) of anammox organisms have high similarities in their structure and function. In the anammox process Hzo converts hydrazine to dinitrogen gas, but it also oxidizes hydroxylamine to NO/N₂O. Therefore, the *hao/hzo* could serve as a specific phylogenetic marker for the organisms involved in ammonium oxidation. The advantage compared to *amoA* is that in an environmental sample aao and anammox organisms could be assessed in one analysis. Such analysis provides also a direct link to the physiological potential of an environment. To establish this link with rRNA-based methods such as fluorescence in situ hybridisation (FISH) is rather difficult. Additionally, immunofluorescence with specific antibodies against the Hao/Hzo provides the possibility to detect the expression of these enzymes in environmental samples.