

Nitrous Oxide *focus group*

Research Group

European Systems Biology of Denitrification (SYSDEN) Group

Overall Aim:

The overall aim of this SysMo2 Consortium (SYSDEN) is to develop an integrated, predictive model of denitrification for a single paradigm organism to obtain a fundamental understanding of the control mechanisms underlying denitrification through the means of quantitative, testable predictions. This model will predict the extent to which the various fluxes as well as the concentrations of denitrification intermediates nitrite, nitric oxide (NO) and N₂O are determined by the various steps in the pathway and how key control coefficients change when signal transduction and gene-expression adaptation occur. This will in the longer term allow scientists globally to undertake comparative studies using our modelling approaches, where a number of relevant phylogenetic groups can be studied. It will also pave the way for the study of denitrification fluxes in “ensembles” of organisms enabling the development of models that describe the behaviour of consortia. For this proposal, however, we strive after constructing a robust model for a single organism that takes into account that denitrifying bacteria can be grown in many different ways in laboratories, reflecting a number of possible different growth conditions they would experience in the environment. Thus the models we will develop will be iterated against data from *P. denitrificans* cultures grown under a range of different conditions in batch, chemostat and retentostat culture and subjected to a range of different perturbations (oxygen, pH, C / N status, copper content and nitrate/nitrite availability).

Partner One: **University of East Anglia**

Partner Two: **Norwegian University of Life Sciences (UMB), PO box 5003, N-1432 Aas Norway**

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UMB Nitrogen Group homepage : <http://www.umb.no/nitrogengroup/>

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Partner Three: **VU University, Amsterdam, The Netherlands**

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Partner Four: **University of Technology, Delft, The Netherlands**

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