

Microbial N transformations course readings

June 6th – 12th

- A. N-transformations and regulatory biology; presentations and practical exercises. N-group (Lars Bakken, Peter Dörsch, Jan Mulder, Linda Bergaust, Binbin Liu and Åsa Frostegård) and Leif Klemmedtson

Burgin, A. J. & Hamilton, S. K. (2007) Have we overemphasized the role of denitrification in aquatic ecosystems? A review of nitrate removal pathways. *Front Ecol Environ* **5**, 89-96.

Schlesinger, W. H. (2009) On the fate of anthropogenic nitrogen. *PNAS* **106**, 203-208.

Bakken, L. R. & Dorsch, P. (2007) Nitrous oxide emission and global changes: modeling approaches. In *Biology of the Nitrogen Cycle*, pp. 381-395. Edited by H. Bothe, S. Ferguson & W. E. Newton. Amsterdam: Elsevier.

Molstad, L., Dorsch, P. & Bakken, L. R. (2007) Robotized incubation system for monitoring gases (O₂, NO, N₂O, N₂) in denitrifying cultures. *Journal of Microbiological Methods* **71**, 202-211.

Bakken, L. R. & Frostegård, Å. (2006) Nucleic acid extraction from soil. In *Nucleic acids and proteins in soil*, pp. 49-73. Edited by P. Nannipieri & K. Smalla. Berlin Heidelberg: Springer-Verlag.

Bergaust, L., Mao, Y., Bakken, L. R. & Frostegård, Å. (2009) Transcription and expression of NO_x reductases in *Paracoccus denitrificans* driven by oxygen depletion, inhibitory effects of suboptimal pH. *unpublished*, 1-22 + supplementary material (separate file)

- B. N₂O emissions and C sequestration; Jørgen Olesen

Smith, P., Martino, D., Cai, Z., Gwary, D., Janzen, H., Kumar, P., McCarl, B., Ogle, S., O'Mara, F., Rice, C., Scholes, B., Sirotenko, O., Howden, M., McAllister, T., Pan, G., Romanenkov, V., Schneider, U., Towprayoon, S., Wattenbach, M & Smith, J. (2008) Greenhouse gas mitigation in agriculture. *Phil. Trans. R. Soc. B* **363**: 789–813.

- C. Denitrifier ecology and denitrifier functional genes; Sara Hallin and Laurent Phillipot

Zumft, W. G. (1997) Cell biology and molecular basis of denitrification. *Microbiology and molecular biology reviews* **61**, 533-616.

Phillipot, L., Hallin, S. & Schloter, M. (2007) Ecology of Denitrifying Prokaryotes. In: *Agricultural Soil*. In: *Advances in Agronomy*, Donald L. Sparks (Ed), pp. 249-305. Elsevier, London.

Jones, C.M., Stres, B., Rosenquist, M. & Hallin, S. (2008) Phylogenetic analysis of nitrite, nitric oxide, and nitrous oxide respiratory enzymes reveal a complex evolutionary history for denitrification. *Mol. Biol. Evol.* 25(9):1955–1966

D. Bacterial reporter genes; Ole Nybroe

Harms, H., Wells, M. C. & van der Meer, J. R. (2006) Whole-cell living biosensors--are they ready for environmental application? *Applied Microbiology and Biotechnology* **70**, 273-280.

E. Nitrogen fixation and sustainable agriculture; Kristina Lindström and Endalkachew Wolde-
meskel

Franche, C., Lindström, K. & Elmerich, C. (2008) Nitrogen-fixing bacteria associated with leguminous and non-leguminous plants. *Plant Soil*, published online December 3rd 2008.

Herridge, D. F., Peoples, M. B. & Boddey, R. M. (2008) Global inputs of biological nitrogen fixation in agricultural systems. *Plant Soil* **311**, 1-18.