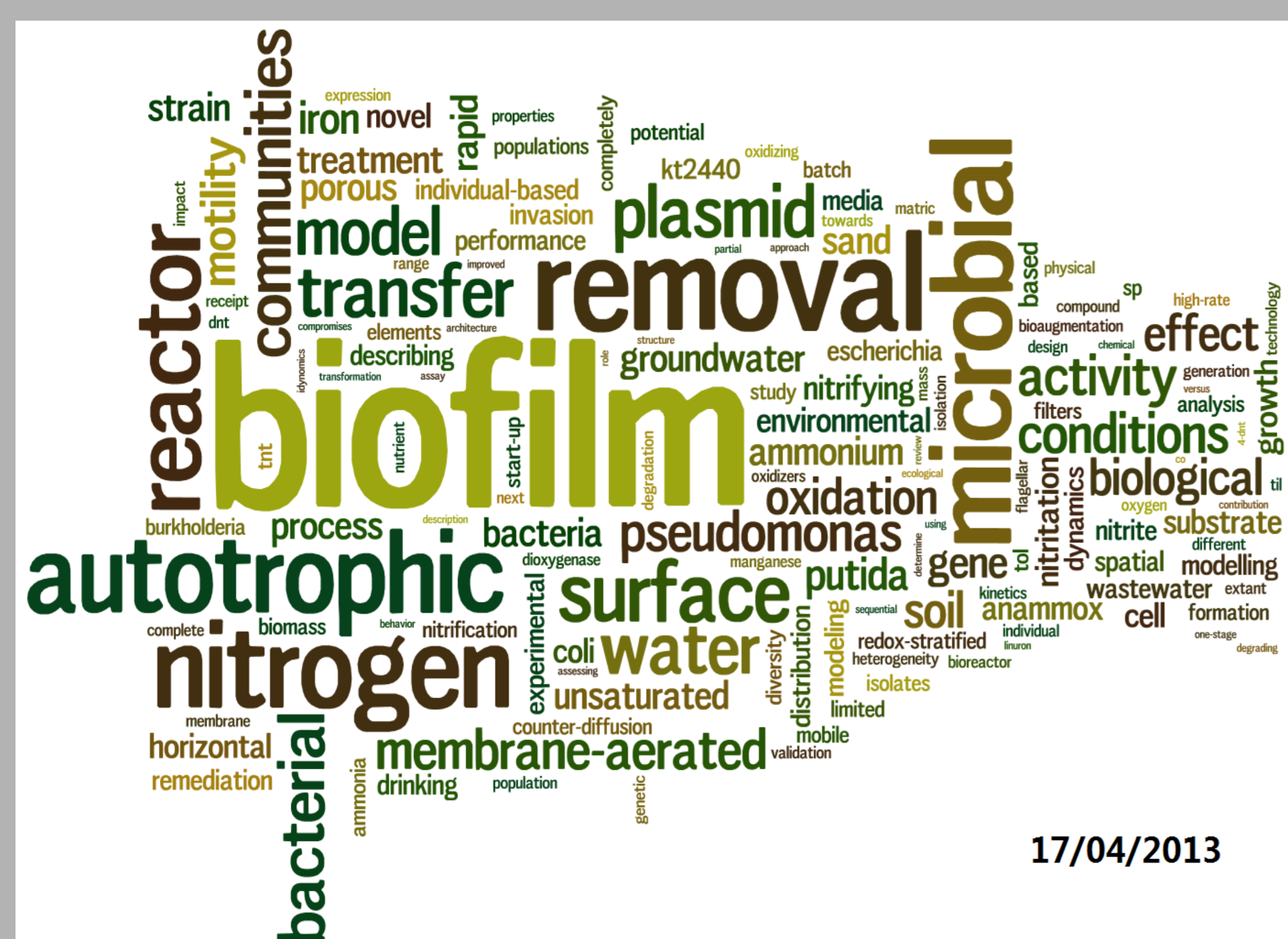


## Research areas of interest



**Systems:** Bioreactors, Agricultural soil, Wastewater, Groundwater, Waterworks biofilters

**Processes:** N-Cycle (nitrification, denitrification, anammox, N<sub>2</sub>O), C-Cycle (CH<sub>4</sub>-oxidation), Fe-Cycle, Co-metabolic pesticide degradation, Horizontal gene transfer (HGT), Resistance gene flow, Bacteria mineral relationships

**Organisms:** Bacteria

## METLAB research group



**Barth F. Smets** (Professor)  
**Arnaud Dechesne** (Senior researcher)  
**Aikaterini Papadopoulou** (PhD student)  
**Arda Gülay** (PhD student)  
**Carles Pellicer i Nàcher** (PostDoc)  
**Carlos Domingo-Felez** (Research assistant)  
**Chen Lu** (Visiting PhD student)  
**Gizem Mutlu** (PhD student)  
**Lasse Pedersen** (PhD student)  
**Lene Kirstejn Jensen** (Head of lab section)  
**Li Liu** (PostDoc)  
**Marlene Mark Jensen** (PostDoc)  
**Uli Klümper** (PhD student)  
**Sanin Musovic** (PostDoc)

## Methods

- Fluorescent marker genes/Bioreporters
- FISH/Confocal Scanning Laser Microscopy
- FACS cell sorting & quantification
- Opposing Gradient Cultivation
- Porous Surface Model
- Bioinformatics (QIIME, MOTHUR, ARB, R, Cytoscape, ...)
- Individual and Population-based Modeling
- Biofilm reactors (membrane aerated, fixed bed, flow-cells ...)

## Resources

### Fieldsites:

- Drinking Waterworks (Islevbro, Sjælsø, Langerød, Astrup)
- CRUCIAL - soils

### Molecular techniques

- Pyrosequencing (454)
- QPCR (Functional Genes & 16S)
- FISH
- DGGE
- Cloning & sequencing

### Analytical tools:

- Advanced Microscopy (CLSM, SEM)
- GC
- Microprobes

## Key publication

1. Terada, A., S. Lackner, K. Kristensen, and B. F. Smets. 2010. Inoculum effects on community composition and nitrification performance of autotrophic nitrifying counter-diffusion biofilm reactors. *Environ Microbiol.* **12**: 2858-2872.
2. Musovic, S., A. Dechesne, J. Sørensen, and B. F. Smets. 2010. A novel assay to measure the permissivity of microbial communities towards horizontal receipt of exogenous mobile elements. *Appl Environ. Microbiol.* **76**: 4813-4818.
3. Dechesne, A., G. Wang, G. Gülez, D. Or, and B. F. Smets. 2010. Hydration controlled bacterial motility and dispersal on surfaces. *Proc. Natl. Acad. Sci. USA* **107**:14369-14372.
4. Merkey, B., L. Lardon, J. Seoane, J. Kreft, and B. F. Smets. 2011. Growth dependence of conjugation explains limited plasmid invasion in biofilms: an individual-based modeling study. *Environ. Microbiol.* **13**: 2435-2452.
5. Seoane, J., Yankelevich, T., Dechesne, A., Merkey, B., Sternberg, C. and Smets, B.F. 2011 An individual-based approach to explain plasmid invasiveness in bacterial populations. *FEMS Microbiol. Ecology.* **75**: 17-27.
6. Gülez, G., A. Dechesne, C. Workman, B.F. Smets. 2012. Whole genome expression dynamics of *Pseudomonas putida* KT2440 under water stress. *Appl. Environ. Microb.* **78**:676-683
7. Pellicer-Nàcher, C., S. Franck, A. Gülay, M. Rusalleda, A. Terada, B.F. Smets. Sequentially aerated membrane biofilm reactors for autotrophic nitrogen removal: Microbial community composition and dynamics. *Microbial Biotech.* *Accepted for Publication*