2 Master thesis

“Maths meets Bio”

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Overarching theme

Ammonia removal in engineered biofilms

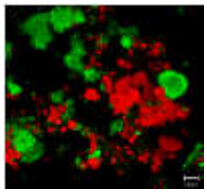
Relevance

Ammonia removal is a key process in wastewater treatment preventing eutrophication of natural water bodies

Tools

Modeling biofilms

Growing and examining biofilms



Skills

Work in an interdisciplinary team

Modeling

- Knowledge on flow and transport modeling
- Knowledge on numerical methods to solve transport problems
- Programing experience

Bio

- Knowledge on microbial growth kinetics
- Basic skills on laboratory work
- Critical analysis of experimental results

Research questions

- What is a good model setup for the description of biomass growth and ammonia transport (→ experiments) incl. appropriate boundary conditions?
- What are suitable numerical schemes to solve the problem?
- Can the model be used to identify limitations of competition mechanisms in the biofilm?
- How ammonium concentration selects for certain Ammonia Oxidizing Microorganisms (AOM) in detriment to others?
- How can we explain the co-existence of several species of AOM with distinct kinetics in the same biofilm?
- Are distinct AOM present in different biofilm layers?