

EN: Factors governing start-up of membrane aerated bioreactors (MABRs)

Background: Biofilm-membrane hybrid systems offer potential as process intensification solutions for water treatment. Efficient operation will rely on a reasonable duration of the reactor start-up phase and establishment of steady state conditions. However, operational factors governing reactor start-up are unknown and require investigation.

The proposed thesis will examine what operational parameters (e.g., intraluminal pressure, recirculation rate) can govern bacterial recruitment and biofilm initiation in membrane aerated bioreactors applied to water treatment applications monitored by optical coherence tomography (OCT). Candidate will work with MABR systems as single-fiber flow cell and pilot-scale and an OCT imaging device.

Following aspects should be included in the thesis:

- Impact of bacterial loading on rate of biofilm development and surface coverage
- Impact of process operation on bacterial recruitment kinetics and biofilm development
- Impact of feedwater composition on bacterial rate of biofilm development
- Scale-up of findings on bench-scale to pilot scale MABR.

Specific information and requirements: Candidates are expected to have a background in microbiology, biochemistry and/or environmental engineering. Candidates with extramural research experience are highly favored. An openness to work with scientists of different disciplinary backgrounds is essential.

Duration: depending on program

Start date: Open

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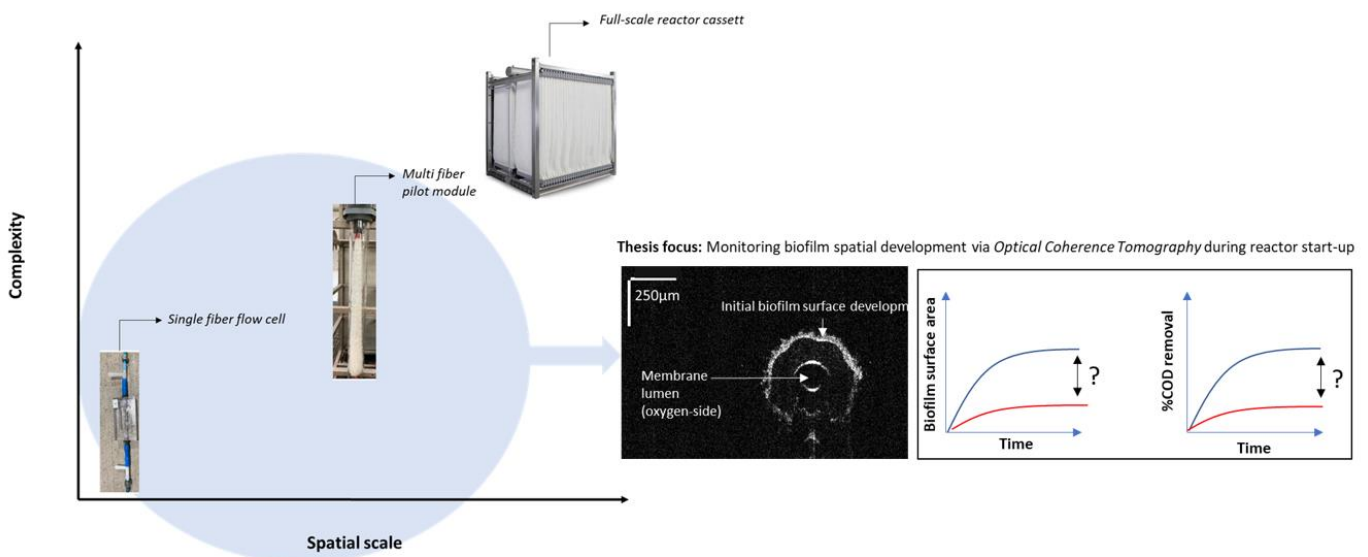


Figure 1 Spatial scale of investigation coupling single fiber flow cells with pilot scale MABR module for monitoring of biofilm growth on the membrane surface