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**Reverse Osmosis Biofouling:   
Emerging Assessment Tools and Control**

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**Abstract**

High quality drinking water can be produced with membrane filtration processes like reverse osmosis (RO) and nanofiltration (NF). As the global demand for fresh clean water is increasing, these membrane technologies are increasingly important.

One of the most serious problems in RO/NF applications is biofouling - excessive growth of biomass - affecting the performance of RO/NF systems. This can be due to the increase in pressure drop across membrane elements, the decrease in membrane permeability or increase in salt passage. These phenomena result in the need to increase the feed pressure to maintain constant production and to clean the membranes chemically.

The presentation contains (i) a short overview of new tools to monitor and characterize biofouling: fouling simulator development, MRI and optical coherence tomography, and (ii) new insights derived with these tools, pilot and full-scale RO/NF installation studies, and will focus on (iii) new potential biofouling control strategies.

Novel strategies to manipulate the biofilm mechanical properties (hydraulic biofilm resistance, cohesion strength, phosphate limitation), to modify the membrane and spacer surface and to remove the biofilm from membrane modules (e.g. using a re-applicable sacrificial coating and biofilm solubilisation) show promising for biofouling control.

**Keywords**: Biofouling control; biofilm growth, drinking water production, water treatment.

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