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

Johannes S. Vrouwenvelder a\*, Noreddine Ghaffour a, Bastiaan Blankert a, Luca Fortunato a, Ghadeer Hasanin a, Graciela Gonzalez-Gil a, Einar O. Fridjonsson b, Mike L. Johns b, Thomas Altmann c, Ratul Das c, Nadia Farhat a

a King Abdullah University of Science and Technology (KAUST), Water Desalination and Reuse Center (WDRC), Division of Biological and Environmental Science and Engineering (BESE), Thuwal 23955-6900, Saudi Arabia.

B Department of Chemical Engineering, The University of Western Australia, Crawley WA 6009, Australia.

C Innovation and New Technology, ACWA Power, 41st Floor, The One Tower, Sheikh Zayed Road, Dubai P.O. Box 30582, United Arab Emirates

\*Corresponding author: johannes.vrouwenvelder@kaust.edu.sa: +966 544700754

**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.

**Presenting author details**

Full name: Johannes Simon Vrouwenvelder

Email: johannes.vrouwenvelder@kaust.edu.sa

Contact number: +: +966 (0)54 4700754966

Affiliation: Director of the Water Desalination and Reuse Center and Professor of Environmental Biotechnology

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