**Fouling Reduction by Membrane Bioreactor Used as a Pre-treatment in Desalination**

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MBR is a suitable and environmentally friendly option for effective control of biofouling .This is because that MBR can remove the biodegradable organic matter and at the same time inactivate the microbes. Submerged membrane adsorption bio-reactors (SMABR) were investigated as a new pre-treatment for seawater reverse osmosis (SWRO) desalination. They were tested with different doses of powder activated carbon (PAC) on-site for a long-term.

MBR without PAC addition resulted in severe fouling on membrane. When PAC is added in the MBR, PAC could reduce the organic fouling. Hence the biofilm formation on membrane was reduced without any membrane damage. PAC also helped to remove low molecular weight (LMW) organics, assimilable organic carbon (AOC) responsible for biofouling of RO membrane.

A small amount of PAC (2.4–8.0 g of PAC/m3 of seawater) was sufficient to reduce biofouling. SMABR is thus an environmentally-friendly biological pre-treatment to reduce biofouling for small SWRO installations.