**A Paradigm Shift for Biofouling Control & Energy Savings in Membrane Bioreactors for Wastewater Treatment: Bacterial Quorum Quenching**

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**ABSTRACT**

Biofouling has been conceived as one of the main obstacles in membrane processes such as membrane bioreactor (MBR) as well as the reverse osmosis/nanofiltration process (RO/NF). Many researchers have tried to mitigate biofouling in various ways, for example, through the change in membrane material, addition of additives or media, changes in system design or operation mode, etc. However, such physico-chemical or engineering approaches to the biofouling problem might not be fundamental solutions because biofouling is an intrinsic natural phenomenon taking place in a ‘complex living community’. In 2008, a revolutionary anti-fouling strategy in MBR was proposed by Lee’s group at Seoul National University, South Korea, by applying the quorum quenching (QQ), i.e., stopping chatter or the disruption of quorum sensing (QS) between microorganisms, which regulates their group behaviors including biofilm formation via the secretion of extracellular polymeric substances (EPS). Since then, QQ-MBR has made progress continuously in terms of QQ-Microorganisms, QQ-Media, and size of QQ-MBR. In this presentation, behind stories will be disclosed during the evolution of QQ-MBR from its birth to present status.