Addition of acyl-homoserine lactones and vanillin to regulate biofilm characteristics and its implication on membrane biofouling

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ABSTRACT

Microbial cells in the biofilm are stabilized on surface with extracellular polymeric substance (EPS). Due to EPS, which is composed of polysaccharides, nucleic acids, and proteins, microorganisms, an adhesive biofilm can be formed. Proper understanding of changes in biofilm properties by regulating the expression of signaling molecules is necessary to control and modulate biofilms. This study investigated the effects of addition of acyl-homoserine lactones (AHL) and vanillin as a controllable factor for the microbial signaling system on biofilm formation. The CDC reactor was used to inoculate *Pseudomonas Aeruginosa*, PAO1, and multi-strains extracted from sludge of a membrane bioreactor in practice. EPS measurements and CLSM analyses were performed to examine both quantitatively and qualitatively biofilm on the membrane surface. The EPS concentrations were varied in accordance with doses of AHL and vanillin. The EPS composition of protein and polysaccharide was also evaluated to determine a critical control factors for biofilm characteristics.
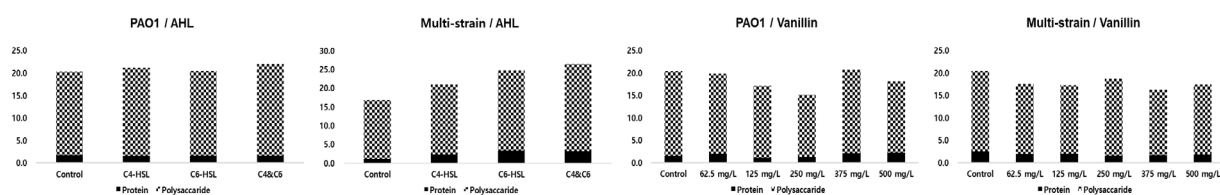
Fig. 1 Variations in EPS concentration on PAO1 and multi-strain biofilms by AHL and vanillin.

REFERENCES

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