

Effects of concentrations of *cis*-2-decenoic acid on biofilm reduction with different contact time in CDC reactor

*Won-Jung Song, Sun-Kyung An, Yong-Min Park, and Ji-Hyang Kweon¹⁾

¹⁾ Department of Environmental Engineering, Konkuk University, Seoul 05029, Korea

¹⁾ jkweon@konkuk.ac.kr

ABSTRACT

Biofouling occurs in the membrane process and has become a problem to the stable production of effluent and maintenance of the process. However, if molecules such as signaling substances or small-molecule inhibitors or activators that affect enzymes or receptors are used, biofilm enhancement and reduction can be controlled, which means that signaling and EPS can be controlled. This study investigated the biofilm formation change of MBR sludge using *cis*-2-Decenoic acid (CDA) as a controllable factor for the microbial signaling system. To investigate the effect of CDA on biofilm formation using MBR sludge, biofilm formation on the membrane surface by microorganisms was confirmed through a CDC reactor, and qualitative and quantitative measurement of biofilm formed on the membrane surface through EPS analysis and CLSM analysis. As a result of EPS and CLSM analysis of biofilm, application of CDA shows that biofilm can be reduced by controlling the mechanism of microorganisms.

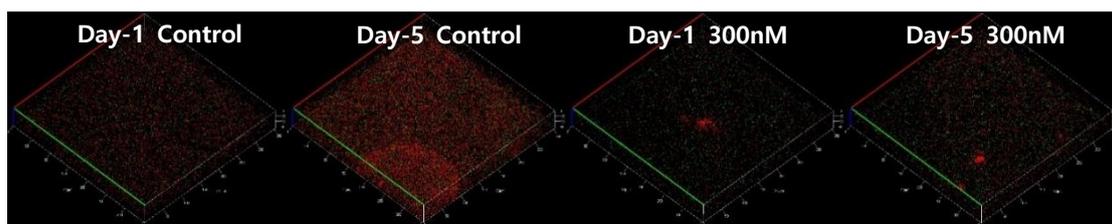


Fig. 1 CLSM image of membrane surface in contact with different concentrations and contact time of CDA. (Live cell : green, dead cell : red)

REFERENCES

Davies, D.G., and Marques, C.N. (2009), "A fatty acid messenger is responsible for inducing dispersion in microbial biofilms", *J Bacteriol.*, **191**(5), 1393-1403.

¹⁾ Professor

*The 2020 World Congress on
Advances in Civil, Environmental, & Materials Research (ACEM20)
25-28, August, 2020, GECE, Seoul, Korea*

Marques, C.N., Davies, D.G., and Sauer, K. (2015), "Control of biofilms with the fatty acid signaling molecule cis-2-decenoic acid", *Pharmaceuticals*, **8**(4), 816-835(2015).