

32nd Asia Pacific

DENTAL AND ORAL HEALTH CONGRESS

July 23- 24, 2018 Sydney, Australia

Characterization of the effects of *Streptococcus mutans* growth conditions on eDNA release

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Background: Extracellular DNA (eDNA) is a component of the biofilm matrix, which also includes microbial cells, exopolysaccharides and proteins. Although many studies have examined eDNA, there is little information available regarding *Streptococcus mutans* eDNA.

Method: To characterize *Streptococcus mutans* eDNA, we cultured the bacteria for 1 to 24 hours in medium with 1% sucrose or 1% glucose. We identified eDNA by using polymerase chain reaction and used DNA-binding dye, SYBR green I to measure the amount of eDNA.

Result: We found that *Streptococcus mutans* eDNA has some differences from *Streptococcus mutans* genomic DNA and that eDNA is secreted at an early growth stage (≤ 1 h post-inoculation). *Streptococcus mutans* produced more eDNA in the supernatant and less eDNA in the pellet in 1% glucose than in 1% sucrose. Although *Streptococcus mutans* cultured in 1% sucrose had more colony forming units (CFUs), the pH values were higher and the CFU-normalized eDNA levels were lower compared to *Streptococcus mutans* cultured in 1% glucose. DNase treatment removed eDNA and significantly reduced the total dry weight (2.6 fold in 1% glucose and 1.4-fold in 1% sucrose).

Conclusion: These results indicate that *Streptococcus mutans* produces different levels of eDNA in different media and that eDNA is an important component aggregator in *Streptococcus mutans* biofilms.

Biography

Miah Kim is a Research Fellow at Chonbuk National University, Republic of Korea.

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