

大学院特別講義

医歯学先端研究特論

Special Lecture of Advanced Medical and Dental Study

(生命理工学先端研究特論) (医歯理工学先端研究特論)

A new strategy and putative mechanisms to reduce *S. mutans* caries risk using sodium fluoride

Streptococcus mutans is the principal causative agent of dental caries, for which sodium fluoride is often used for prevention. It is known that the enzyme enolase is very sensitive to fluoride, which would decrease *S. mutans* growth. Fluoride at concentrations greater than 0.01 mM was found to be an irreversible inhibitor of enolase of *S. mutans*. However, school-based sodium fluoride mouthwashes did not show any change for *S. mutans* in vivo study. The genome sequence of *S. mutans* suggests the presence of a putative fluoride transporter, which is referred to as a chloride channel permease. We found that two homologs of this gene reside in tandem in the genome of *S. mutans*. We have known for a long time that stannous fluoride and stannous chloride showed a much greater inhibition of growth rate of *S. mutans* than did sodium fluoride or zinc chloride. Therefore, stannous ion may be the key inhibitor of fluoride and chloride ion channel of *S. mutans*. The aim of my lecture was to determine whether the chloride channel permeases contribute to fluoride resistance. Based on the data, I will suggest a new strategy to reduce *S. mutans* caries risk using Dental Drug Delivery System (3DS).

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at Demonstration room

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