

## 論 文 要 旨

Comprehensive characterization of sortase A-dependent  
surface proteins in *Streptococcus mutans*

〔 *Streptococcus mutans* における  
ソルターゼ A 依存性表層タンパク質の網羅的性状解析 〕

勝俣 環

*Streptococcus mutans*, a cariogenic pathogen, adheres to the tooth surface and forms a biofilm. Bacterial cell surface proteins are associated with adherence to substrates. Sortase A (SrtA) mediates the localization of proteins with an LPXTG motif-containing proteins to the cell surface by covalent binding to peptidoglycan. In *S. mutans* UA159, 6 SrtA-dependent proteins, SpaP, WapA, WapE, DexA, FruA, and GbpC, were identified. Although some of these proteins were characterized, a comprehensive analysis of the 6 proteins has not been reported. In this study, we constructed mutants deficient in each of these proteins and the SrtA-deficient mutant. The SrtA-deficient mutant showed drastically decreased binding to salivary components, biofilm formation, bacterial coaggregation activity, hydrophobicity, and cellular matrix binding (collagen type I, fibronectin, and laminin). The SpaP-deficient mutant showed significantly reduced binding to salivary components and partially increased coaggregation with *Porphyromonas gingivalis*, and decreased hydrophobicity, and collagen binding. The WapA-deficient mutant showed slightly decreased coaggregation with *Fusobacterium nucleatum*. Although the SrtA-deficient mutant showed drastically altered phenotypes, all SrtA-dependent protein-deficient mutants, except the SpaP-deficient mutant, did not show considerable alterations in binding to salivary components. These results indicate that the 6 proteins may coordinately contribute to these activities. In addition, using genomic data of 125 *S. mutans* strains, we compared the amino acid sequences of each surface protein and found many variations among strains, which may affect the phenotype of cell surface proteins in *S. mutans*.