

学術奨励賞 受賞講演 2

Contribution of phosphoglucosamine mutase to determination of bacterial cell morphology
in *Streptococcus gordonii*

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Phosphoglucosamine mutase (GlmM; EC 5.4.2.10) catalyzes the interconversion of glucosamine-6-phosphate to glucosamine-1-phosphate, an essential step in the biosynthetic pathway leading to the formation of the peptidoglycan precursor uridine 5'-diphospho-*N*-acetylglucosamine. We have recently identified the gene (*glmM*) encoding the enzyme of *Streptococcus gordonii*, an early colonizer on the human tooth and an important cause of infective endocarditis, and indicated that the *glmM* mutation in *S. gordonii* appears to influence bacterial cell growth, morphology, and sensitivity to penicillins. Moreover, the *glmM* mutation results in increased sensitivity to polymorphonuclear leukocyte (PMN)-dependent killing. In the present study, we observed similarities in the utilization of sugar between the wild-type strain and the *glmM* mutant of *S. gordonii* when cultivated with medium containing 0.2% glucose, fructose, lactose, or sucrose. Morphological analyses clearly indicated that the *glmM* mutation causes marked elongation of the streptococcal chains, enlargement of bacterial cells, increased distortion of the bacterial cell surface, and defects in cell separation. These results suggest that mutations in *glmM* appear to influence bacterial cell growth and morphology, independent of the carbon source.