

**The role of pyruvate kinase (PK) and glucokinase (GCK) in *Streptococcus mutans* mixed biofilm development**

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**Background:** Carbohydrate metabolism is one of the key metabolic pathways subject to changes during *Streptococcus mutans*-mixed biofilm development.

**Aim:** The objective of this study was determination of the role of GCK and PK in *S. mutans* pathogenicity.

**Material & Methods:** Pyruvate kinase and glucokinase from *S. mutans*-mixed biofilm species were purified, precipitated and estimated fluorimetrically. The study was performed on type and clinical strains. In total, 21 children with caries were enrolled, ( $4 \pm 1.7$  years). As many as 22 individuals without caries ( $4.12 \pm 1.22$  years) served as the control group. Phenotyping of isolated bacterial strains was performed, and evaluated by 16S rDNA gene sequencing. Biofilm assay was carried out according to current protocols in microbiology.

**Results:** Out of 100 isolated strains, 74 were classified as *S. mutans* species. PK and GCK activities were highest after 6 and 12 hours incubation in the mixed biofilm species. PK activity was higher (1.45 mU/mg of protein) in the experimental group compared to the control (1.10 mU/mg of protein).

**Conclusions:** The glycolytic activity increases in the newly formed biofilm after 6 and 12 hours of incubation; however, this activity decreases with dental plaque biofilm aging. It was demonstrated that the amount of synthesized PK in *S. mutans*-mixed biofilm species grows in the caries group. Inhibition of glycolysis metabolic pathway proteins during mixed-species biofilm of *S. mutans* development may have an effect on reduction of the development of dental caries in children.

**Biography**

Wirginia Krzysciak has completed her PhD from Jagiellonian University, Poland. She is an Assistant Professor in the Department of Medical Diagnostics, Faculty of Pharmacy, Medical College, Jagiellonian University in Krakow, Poland. She has published more than 20 papers in peer-review journals on Caries Pathogenesis and Redox Signaling. She is a Lecturer and one of the Instructors of Laboratory Medicine where she teaches Hematology, Laboratory Medicine and Medical Diagnostics. She is also a Founder and the Instructor of Students Association of Laboratory Diagnosticians. She is a Member of Polish Society of Microbiologists and Polish Society of Biochemistry.

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