

# Pengaruh streptococcus mutans-binding salivary protein yang diisolasi dari subjek pelari dan nonpelari terhadap pertumbuhan biofilm streptococcus gordonii in vitro = The impact of streptococcus mutans binding salivary protein isolated from runners and non runners to biofilm growth of streptococcus gordonii in vitro

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## Abstrak

Olahraga merupakan aktivator stimulus simpatis yang dapat mempengaruhi sekresi saliva sehingga menyebabkan peningkatan viskositas dan konsentrasi protein saliva, salah satunya Streptococcus mutans-binding salivary protein.

Tujuan: Menganalisis pengaruh S. mutans-binding salivary protein yang diisolasi dari subjek pelari dan nonpelari terhadap pertumbuhan biofilm Streptococcus gordonii.

Metode: Pemilihan subjek pelari dan nonpelari ditetapkan berdasarkan metode subjektif melalui riwayat lari dan metode objektif melalui pengukuran VO<sub>2</sub>max. S. mutans-binding salivary protein didapatkan melalui interaksi protein saliva pelari dan nonpelari dengan bakteri S. mutans. Uji pertumbuhan biofilm bakteri S. gordonii ATCC 10558T dilakukan dengan pewarnaan crystal violet. Data yang didapat kemudian dianalisis dengan uji statistik menggunakan uji One-way ANOVA.

Hasil: Pertumbuhan biofilm S. gordonii pada S. mutans-binding salivary protein pelari meningkat tetapi tidak signifikan  $p > 0.05$  baik pada waktu 3 jam maupun 24 jam. Pertumbuhan biofilm S. gordonii pada S. mutans-binding salivary protein nonpelari tidak signifikan  $p > 0.05$  pada waktu 3 jam kemudian meningkat signifikan  $p < 0.05$  pada waktu 24 jam.

Kesimpulan: S. mutans-binding salivary protein dari subjek pelari tidak memiliki pengaruh dalam menghambat pertumbuhan biofilm S. gordonii, sedangkan protein saliva dari subjek nonpelari efektif memfasilitasi pada fase maturasi.

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Physical exercise is a strong activator of sympathetic stimuli which may affect salivary secretion by increasing viscosity and concentration of salivary protein, including Streptococcus mutans binding salivary protein. Salivary protein may act as antimicrobial agent or may facilitate the growth of biofilm.

Objective: to analyze the impact of S. mutans binding salivary protein from runners and from non runners to biofilm growth of S. gordonii.

Methods: Runners and non runners were selected based on running history and VO<sub>2</sub>max test. S. mutans binding salivary protein was obtained through the interaction of runners and non runners salivary protein with S. mutans. Biofilm growth assay of S. gordonii ATCC 10558T was conducted using crystal violet staining. The data obtained was statistically tested using One way ANOVA test.

Results: Biofilm growth of S. gordonii in runners group is insignificantly increased  $p > 0.05$  either in three hour or twenty four hour incubation. Meanwhile, biofilm growth of S. gordonii in non runners group is significantly increased after twenty four hour incubation  $p < 0.05$ .

Conclusion: S. mutans binding salivary protein from runners has no inhibition effect on biofilm growth of S. gordonii, while that from non runners facilitates biofilm growth of S. gordonii at maturation phase.