

## The Effectiveness of Propolis Extract in Reducing Lipoteichoic Acid from *Enterococcus faecalis* in Human Periodontal Ligament Fibroblast

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### ABSTRACT

**Background:** *Enterococcus faecalis* is the most common cause of root canal treatment failure. This gram-positive bacteria has many virulence factors and lipoteichoic acid is the most pathogenic one. Lipoteichoic acid bonds with toll-like receptor in periapical tissue, then activates  $\text{Nf}\kappa\beta$  to stimulates pro-inflammatory mediator, such as  $\text{TNF-}\alpha$ , IL-8, and IL-1 $\beta$ , thus leads to periodontal destruction, and pericapical lesion, results in endodontic treatment failure. Propolis is a natural resource contains flavonoid as an active agent which has many benefits, like antibacterial and anti-inflammatory agent, and it is expected to inhibit the bond between lipoteichoic acid with toll-like receptor. This experimental research was done using human periodontal ligament fibroblasts (HPdLfs) to examine if propolis extract can reduce the amount of lipoteichoic acid from *Enterococcus faecalis* through the expression of toll-like receptor 2 dan toll-like receptor 4. **Method:** human periodontal ligament fibroblasts (HPdLfs) is exposed with lipoteichoic acid which is purified from *E. faecalis*, then being examined using immunohistochemical technique. **Result:** The reduction of expression from toll-like receptor 4 is greater than toll-like when treated with propolis extract. **Conclusion:** Propolis extract is effective in reducing lipoteichoic acid from *Enterococcus faecalis* in human periodontal ligament fibroblast through the expression of toll-like receptor.

**Keywords:** propolis extract, lipoteichoic acid, *Enterococcus faecalis*, toll-like receptor

