LPS-Binding Protein Down-regulates IL-6 Expression by Human Gingival Fibroblasts

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LPS-binding protein (LBP) plays a critical role in the modulation of innate immune response by enhancement of CD14-dependent activation of host cells by LPS or neutralization and clearance of LPS. Our recent study for the first time showed that LBP could be expressed in human gingiva and its expression levels in periodontally healthy subjects were significantly higher than in patients with chronic periodontitis. **Objectives**: This *in vitro* study aimed to investigate the effects of LBP and *E. coli* LPS on the expression of IL-6 and relevant pattern recognition molecules by human gingival fibroblasts (HGF). **Methods**: The mRNA expression of IL-6, CD14, LBP, TLR-2, TLR-4 and MD-2 in HGF explants was detected by RT-PCR in the presence or absence of *E. coli* LPS and recombinant human LBP (rhLBP). IL-6 protein was analyzed by ELISA and immunohistochemistry respectively. **Results**: Basal expression of IL-6, CD14 and MD-2 mRNAs by HGF was observed. *E. coli* LPS (5 μg/ml) induced the expression of TLR-2, TLR-4 and MD-2 messages. The expression of both IL-6 message and peptide was up-regulated by *E. coli* LPS in a dose dependent manner ($p<0.05$). Whereas rhLBP (0.1μg/ml) down-regulated both mRNA and peptide expression of IL-6 ($p<0.01$) and CD14 but not MD-2 signals in the presence of *E. coli* LPS. The up-regulated expression of TLR-2 and TLR-4 by *E. coli* LPS no longer existed in the presence of rhLBP. No expression of LBP by HGF *per se* was observed. **Conclusions**: This study suggests that LBP may down-regulate the expression of IL-6 by HGF. Further studies are warranted to clarify the molecular mechanisms of LBP in modulation of cytokine expression by host cells and to elaborate the relevant clinical implications. This study was supported by the Hong Kong Research Grants Council, HKU 7310/00M.

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