

TITLE: CYTOTOXICITY AND EFFECT OF CATIONIC PEPTIDES FRAGMENTS AGAINST ORAL BACTERIA

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ABSTRACT

Limited research has been conducted for determining the effectiveness of individual and combination of synthetic or natural chemotherapeutic agents to prevent or reduce the incidence of dental caries. The objective of this study was to evaluate the cytotoxicity and antimicrobial/anti-biofilm activity of fragments derived from oral cationic peptides (CP): LL-37 (from hCAP-18), D6-17 and D1-23 (from β -defensin-3 derivative) against cariogenic bacteria. For cytotoxicity analysis, two lines of epithelial cells were exposed to serial dilutions of the CP fragments and MTT assays were performed to evaluate cell metabolism. Minimum inhibitory concentration (MIC) and minimal bactericidal concentration (MBC) were determined for CP fragments and control (chlorhexidine-CHX) against *Streptococcus mutans* (*Sm*), *S. mitis*, *S. oralis*, *S. salivarius*, *S. sanguinis*, *Lactobacillus acidophilus*, *L. casei*, *L. rhamnosus*, *L. brevis*, *L. fermentum*, *Actinomyces israelii*. Fractional inhibitory concentration (FIC) was obtained for the combinations of CP fragments on *S. mutans*. Biofilm assays were conducted with CHX and the best antimicrobial CP fragment against *S. mutans* strains. D6-17 did not affect metabolism of both cell lines. D1-23, LL-37 and CHX were toxic for both cells, in the concentrations above 0.2, 0.02 and 0.01mM, respectively. D1-23 had the best bactericidal activity against *S. mutans*, *S. mitis* and *S. salivarius*. LL-37 had better effect against *Lactobacillus* and *Actinomyces* species. D6-17 had bactericidal activity only against *S. mutans*, *L. brevis* and *L. fermentum*. Combinations of CP fragments did not show synergic effect against *S. mutans*. D1-23 (10x MBC) had superior *S. mutans* anti-biofilm effect compared to CHX. D1-23 had remarkable antimicrobial/anti-biofilm effect against cariogenic bacteria and low toxicity on epithelial cells.

Keywords: Cell Culture; Dental Caries; Microbial Sensitivity Tests; Peptides.

Development Agencies: FAPESP 2012/19235-5 and 2013/12285-0.