

TITLE: ANTIMICROBIAL EFFECT OF THE PEPTIDES KR-12 AND [W7]KR12-KAEK ON PLANKTONIC CELLS AND BIOFILMS OF *Enterococcus faecalis* STRAINS

AUTHORS: VASCONCELOS, M.A.¹; SILVA, B.R.¹; NASCIMENTO-NETO, L.G.¹; CONRADO, A.J.S.¹; LIMA, S.S.A.¹; LORENZÓN, E.N.; CILLI, E.M.; TEIXEIRA, E.H.¹

INSTITUTION: ¹LABORATÓRIO INTEGRADO DE BIOMOLÉCULAS, DEPARTAMENTO DE PATOLOGIA E MEDICINA LEGAL, UNIVERSIDADE FEDERAL DO CEARÁ, FORTALEZA, CE (RUA MONSENHOR FURTADO, 1176, CEP 60.441-750, FORTALEZA - CE, BRASIL); ² INSTITUTE DE QUÍMICA, UNIVERSIDADE ESTADUAL PAULISTA, ARARAQUARA, SP (RUA PROF. FRANCISCO DEGNI, CEP 14800-060, ARARAQUARA – SP, BRASIL)

ABSTRACT:

Enterococcus faecalis is as one of the main pathogens associated with endodontic infections and one of the most studied in the field. In fact, several studies show that *E. faecalis* is present in 32-82% of endodontic lesions, being considered one of the main microorganisms related to persistent endodontic lesions. Thus, the purpose of this study was to evaluate the antimicrobial and antibiofilm activity of the native peptide KR-12 and its derivative the synthetic peptide [W7]KR12-KAEK on the planktonic and biofilm of *Enterococcus faecalis* strains. The methods used to evaluate antimicrobial activity included determination of the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). The biofilm formation and mature biofilms were evaluated by quantification of biomass by crystal violet staining and counting of colony forming units. In addition, structure assessments of biofilm and cellular morphological changes were analyzed by scanning electron microscopy (SEM). The microorganisms grown in Brain Heart Infusion broth at 37 °C under atmospheric pressure with 5% CO₂. The peptides were solubilized in 0.1% acetic acid (v/v) at various concentrations (500 to 3.9 µg/ml). Chlorhexidine gluconate 0.12% was used as the positive control, and BHI culture medium was used as the negative control. The tested peptide [W7]KR12-KAEK demonstrated a remarkable antimicrobial and antibiofilm effects, inhibiting the planktonic, biofilm formation and caused disruption of mature biofilms of all strains tested, even at low concentrations. The SEM images of the mature biofilms of confirmed these results. On the other hand, the KR-12 did not exhibit any antibacterial or antibiofilm effect. The peptide [W7]KR12-KAEK is a potential biotechnological input for the development of auxiliary antimicrobial therapies for endodontic treatment.

Keywords: *Enterococcus faecalis*, antimicrobial peptides, biofilm

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